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ABSTRACT

Intended to gain information about students who have difficulty organizing text when they write, a study probed students' ability to recognize and understand varying degrees of text organization while reading. Ninety ninth-grade students, divided equally into groups of good readers/good writers, good readers/poor writers, and poor readers/poor writers, were asked to read cause/effect paragraphs from natural text in three text conditions (ordered, scrambled, and reconnected) and two levels of passage difficulty (sixth and ninth grade). Data included recall of paragraphs, ability to judge paragraphs for organizational clarity, ability to unscramble poorly organized paragraphs, and interviews. Significant main effects were found for: passage difficulty, ability group, and text condition on the recall measure; text condition on the organizational judgment task; and ability group and passage difficulty on the unscrambling task. Results also indicated: (1) an interaction between ability group and text condition on the organizational judgment task; and (2) that all students judged ordered paragraphs to be better organized than the two scrambled conditions. Good readers/good writers, however, were more cognizant of the differences between scrambled and reconnected text than were the other two groups. Findings suggest that good readers who are poor writers have an ability to create better organized text, yet, similar to poor readers/poor writers, they lack a clear understanding of the function of clear cohesive relationships. (A sample paragraph in the 3 text conditions, instructions for subjects, interview questions, 4 appendixes of data, and 43 references are attached.) (Author/RS)

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Text Organization in Reading: What Ninth Grade Good and Poor Readers and Writers Know

Peter R. Thacker

Grant # R 11K80029

A Report Presented to the Office of Educational Research and Implementation, U.S. Department of Education
1991

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FOREWORD

This research report was first published as my dissertation for Harvard University in a slightly altered form. This report contains a discussion of strategy interviews which were not a part of my dissertation research and no discussion of a reading speed measure asked for by my dissertation committee, but not by the OERI. In addition, the background chapter is truncated in this report and a discussion of my efforts to disseminate my findings is added.

I had great cooperation in the completion of this study. My first thanks go to my advisor at Harvard, Mary Beth Curtis. She provided advice, counsel, and consummate editing in shaping, performing, analyzing, and reporting this research. My other two committee members from Harvard, Jeanne Chall and Catherine Snow, provided expertise, vision and a supportive atmosphere which made this a better piece of research.

One of the requirements of the "Teacher as Researcher" grants was that teachers would be given strong support from their school district. I could not have performed this research without the broad-based, enthusiastic support of the Research and Evaluation Department, the Grants

Management staff, high school administrators, and teachers.

The Research and Evaluation Department in my school district knew of my research interests in advance of the grant application for these grants. They encouraged my application and showed continued interest and support throughout the study. The District is deeply committed to improving student writing through thoughtful application of curriculum based on insights found both through research and teaching.

My original liaison from the department, Evelyn Brzezinski, provided access, advising, and editing through the proposal, data collection, and drafting stages of this report. Her help went well beyond her obligation to my project. Gary Williams, who took Evelyn's place, also gave willingly of his time and expertise.

Maurice Caba, the head of Grants Management, gave advise and technical support during the proposal and data gathering for this report. I appreciate his accessibility, especially in light of the fact that my project was minuscule in relation to other grants processed through the District.

My principal, Bob O'Neill, and curriculum vice-principal, Darrell Tucker demonstrated great interest in my study and provided a flexible schedule which allowed me to

collect data during the school day. Without their cooperation and support, I could not have completed this report.

Administrators and English Department chairs in four other high schools also graciously ran interference for me as I asked students to participate and, then, gathered data. These helpful individuals included Tom Parr, Dave Williams, John Vingelen, Myra Rose, Joan Crosby, Gene Jenkins, Colin Karr-Morse, Velma Johnson, Lyle Meyer, George Guthrie, and Audrey Haynes. I thank also the many teachers in these schools who allowed me to recruit and test students during class time.

The teachers in my department allowed me to collect writing samples, prodded students to participate in the study, and propelled me into completing this project. Sylvia Skarstad, Sarah McKenzie and Charlotte Pennington helped in reading and rating pilot writing samples. Bill Miller, Joan Brenner, Joan Swinney, Jeanette Swenson, Mary Ayala, Alex Gordin, Gordon Bolton, and Claude Bonfiglio placed themselves and their students at my disposal.

To perform this research necessitated finding several individuals willing to help in the analysis of the data. I found two able, hard-working colleagues in my own English Department, Robin Davis and Jim Mayer. Robin and Jim

assisted me in endless hours of analyzing data. They helped produce rubrics and read scores of essays and protocols. They are true teacher/researchers.

Jane Braunger and Andy Clark, both language arts specialists from the District's Curriculum Department listened to my ideas, read drafts of proposals and chapters and provided the feedback necessary to spur me on.

I received assistance as well from a high school student, Edward Garrett, who created the software to run my study. He and Shelly Jackson also took on the arduous task of transcribing recalls.

Tom Owen, an able statistician from a local university, provided tireless statistical assistance.

I feel privileged to have worked with the above-mentioned individuals and many others in completing this report.

I also deeply appreciate the grant accorded me by the Office of Educational Research and Implementation of the U.S. Department of Education. The grant provided funds to help pay for creation of the software and analysis of the data for this research. But even more significantly, it propelled me to think of my research in more practical terms, a great service as I was struggling to frame my questions for my research.

ABSTRACT

This study was designed to probe students' ability to recognize and understand varying degrees of text organization while reading. The study was done with the intention of gaining information about students who have difficulty organizing text when they write.

Ninety ninth grade students, divided equally into groups of good readers/good writers, good readers/poor writers, and poor readers/poor writers, were asked to read cause/effect paragraphs from natural text in three text conditions (ordered, scrambled, and reconnected -- a scrambled paragraph in which relationships between sentences have been made clearer) and two levels of passage difficulty (6th and 9th grade). Students' ability to assess organization was examined by analyzing their 1) recall of paragraphs in all text structures and conditions, 2) ability to judge paragraphs for organizational clarity, and 3) ability to unscramble poorly organized paragraphs. Students were also interviewed about strategies used to accomplish each task.

Significant main effects were found for passage difficulty, ability group, and text condition on the recall

measure; for text condition on the organizational judgment task; and for ability group and passage difficulty on the unscrambling task. An interaction between ability group and text condition was found on the organizational judgment task. All students judged ordered paragraphs to be better organized than the two scrambled conditions; however, good readers/good writers were more cognizant of differences between scrambled and reconnected text than the other two groups. Good readers/good writers and good readers/poor writers outperformed poor readers/poor writers on the unscrambling task. Performance on the recall task was good reader/good writer > good reader/poor writer > poor reader/poor writer, though differences between the two groups of good readers only approached significance.

Results of this study suggest that good readers who are poor writers have an ability to create better organized text, yet, similar to poor readers/poor writers, they lack a clear understanding of the function of clear cohesive relationships. Both groups of poor writers demonstrated an ability to judge poorly organized text as disorganized. This fact provides an entry for discussions with poor writers about the elements of organization which they need to address when they revise their own work.

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Chapter 1: Background to the Study

Should students be taught to write through an emphasis on their knowledge about reading? Can insights learned from probing students' knowledge about organizational patterns in reading be used to teach organization in writing more effectively? In this research study, I have explored a first step toward addressing these questions in search of more effective teaching of the writing process.

I teach in a remedial English classroom in an urban, working class, high school. Several years ago, I asked students to arrange a randomly ordered set of sentences from an expository paragraph into an order they thought made sense. Many chose for their first sentence a sentence commencing with "they", though who "they" was remained unclear throughout the remainder of the reordered paragraph. I have often since noted that students write with the same lack of organization and thought about how language functions to hold ideas together. My goal in this study was to explore what these students know about organizational factors in text in order to better teach them to pay attention to those organizational factors when they write.

I have a particular interest in approaching organizational difficulties through examining the reading

patterns of my poor writers. It has been my experience that some of my students read better than they write. In this study, I examined these and other students' receptive knowledge of how good writing is structured. Through examining this receptive knowledge, I hoped to gain insight into how to structure instruction that helps students to examine their own writing for its organizational deficiencies.

In conjunction with this interest, I also was interested in exploring connections between reading and writing. Stotsky (1984) suggested in her review of research into reading/writing relationships that understanding students who were good readers but poor writers would be an important step in further understanding how reading and writing are interrelated.

At the same time, this study contrasted the performance of good readers who were poor writers with students who were both poor readers and poor writers. I have an interest in examining what those two groups of students understand about how text is structured. Can both groups differentiate between well and poorly organized text when reading and, if not, what factors cause which students the greatest difficulty?

My concern with organization in writing is based on

evidence both in the research literature and in my school district. Organization is cited as one of the important aspects of writing separating good and poor writers (Hillocks,1986). Indeed, organization is one feature that teachers frequently use when they evaluate students' writing (Breland and Jones, 1982; Freedman, 1979). For example, Freedman and Calfee (1983) found that organization was positively correlated to holistic ratings of essays written by college students. However, many writing teachers and researchers (e.g., Elbow, 1981; Flower & Hayes, 1981; Macrorie, 1976) suggest that traditional methods of teaching organization are ineffective and may even interfere with students' ability to express ideas.

On the local level, my school district has begun to use a direct assessment of writing to measure students' strengths and weaknesses. Organization is one of six sub-components of writing skill assessed through analytic scoring of the students' writing samples. In the Fall of 1987, approximately one third of ninth graders in four high schools in the district were judged to organize their essays ineffectively; this on a writing sample which allows students two opportunities to revise their original draft. In addition, approximately one third of the students in this sample found to be poor in organization were also good

readers suggesting that, perhaps, there were two different populations who needed instruction in organizing text - one which seemed capable of using organizational aspects of text to help them when reading and one which did not.

In summary, this research study grew from my curiosity about how my students read and write. That curiosity was enhanced by my review of the literature, which indicated that the ability to organize text is important to producing well written work; and, further, that better understanding of how students use organization in text to help them comprehend what they read may provide clues for the more effective teaching of organization when they write.

Chapter 2. Overview of the Present Study

In the research study I will describe in the body of this thesis, I examined ninth grade students' ability to read, judge, and manipulate well and poorly organized text. This was done with an eye to understanding the connection between what students know implicitly about text organization when they read and what they do when they organize text when they write. Should students be aware of aspects of organization when they read that they don't employ when reading and revising their own text, then they could be taught to apply that backgrounded knowledge to their own revision.

Organization's Contribution to Meaning in Text: How does organization help to make text comprehensible? What difference does understanding how students organize text when reading make in how we approach teaching students who are having difficulty organizing text when they are writing? One method of understanding what students need to know about organizing text when writing is to approach the issue from a reading standpoint.

Van Dijk and Kintsch (1983) have posited a model which suggests that when readers read material, they attempt to create what they call a "macrostructure" of the text. This

macrostructure encompasses the main ideas from the text that readers need to hold in memory. The less important information, known to us as details, is called the "microstructure".

There are several organizational factors used in text that help readers create macrostructures. For example, van Dijk and Kintsch suggest that placing information that is needed to create macrostructures early in the text makes it easier for readers to understand main ideas. In other words, when the main idea in a paragraph is clear in the first few sentences, reading is most efficient.

Macrostructures are also made clear through the language in a text. Halliday and Hasan (1976) described cohesion as those aspects of language which help tie words and sentences together into a meaningful whole, allowing them to be interpreted as a unified text.

Several linguistic elements have been considered particularly important to cohesion in text. These elements, called cohesive ties by Halliday and Hasan, include such categories as conjunctions, definite articles, repeated nouns, pronouns, synonyms, and specific cases of a general term (e.g., tree/elm). Most cohesive ties function through co-referring to phrases in preceding or following sentences (e.g.; "A ball floated in the ocean. The tiny sphere bobbed

up and down." In this example, "the sphere" is a cohesive tie because it refers through synonymy to "a ball" in the previous sentence.).

Conjunctions, however, function by connecting ideas logically (e.g., The ball swayed as it bobbed. Therefore, it was hard to see.) or temporally (e.g., The girl reached the ball. Finally, she cupped it in her hand.). There is evidence (e.g., Irwin, 1980; Marshall and Glock, 1978; Meyer, 1984) that conjunctive cohesive ties can also provide important links in text which help readers to process text more easily. Organizational factors in language, therefore, also help readers to integrate and comprehend text.

Kintsch and van Dijk (1978), in a similar analysis to Halliday and Hasan, have proposed that concepts are often held in memory on the basis of the number of times they are referred to in close proximity in the text. Repeated reference to concepts, then, seems to create a context for discriminating between what is important and what is not.

Beyond this, it has been established that increased distance between referents creates comprehension difficulties (Cirilo, 1981; Clark and Sengul, 1979), especially when the intervening material is not semantically related to the separated co-referents (Lesgold, Roth, and Curtis, 1978). Therefore, reference is maintained through

close proximity in a semantically related milieu. It is difficult to realize the macrostructure of a text if referents are separated by intervening material unrelated to the co-referents.

Finally, writing which follows a particular text structure seems to help readers integrate text. Expository text includes several types of text structures which, when clear, seem to aid readers in gaining information from text (Armbruster, Anderson, and Ostertag, 1987; Richgels, McGee, Lomax, and Sheard, 1987). Meyer (1984) has delineated several types of text structures used by writers of expository prose. These include comparison/contrast, cause/effect, problem/solution, description, enumeration, and temporal sequence. Each of these structures requires a particular organization of ideas to achieve its purpose.

Interestingly, Meyer reports that able readers' recall of information written in a particular text structure shows the propensity to maintain that same structure, while less able readers do not follow the text's pattern when recalling its content. Able readers' recalls also show greater retention of information.

I have highlighted three aspects of text which contribute to its organization: 1) clear main idea, 2) clear cohesive language, and 3) clear text structure. These

aspects of text interact with a reader's knowledge about content, about how language links ideas together, and about text structures in order to help readers make sense of text. An understanding of how good and poor writers use these organizational factors when reading might provide clues as to how to work with them to improve their organization when they write.

Creating the Study's Tasks: In this next section, I will describe the tasks I chose to use in examining what students of varying ability understand about text organization when reading. I chose to focus on three tasks to determine how students responded to well and poorly organized text: 1) a comprehension task, 2) a rating of organizational clarity, and 3) an unscrambling of mixed up sentences and, then, to ask students about the strategies they used to perform each task..

To begin, I wanted to examine how students comprehended text varying in its organization. One method of determining this type of question is to disrupt the macrostructure of a piece (Kintsch and Yarbrough, 1982; Richgels, McGee, Lomax, and Sheard, 1987). For this study, I wanted to first disrupt the macrostructure, then to go one step further by examining the effects of "repairing" cohesive structures (Halliday & Hasan, 1976) such as reference and conjunction

in the sentences in a paragraph which has been scrambled. Scrambling creates a paragraph in which the macrostructure is unclear and ideas no longer are based on the "given-new contract" (Clark & Haviland, 1977) -- a contract which suggests that an idea brought up in one sentence will be alluded to in the next. Repairing the cohesive language creates clearer connections sentence to sentence by clarifying unspecific referents such as "they" and eliminating illogical connectives created by the scrambling (see Appendix A for a specific example). This repairing of scrambled material has been attempted by Garnham, Oakhill, and Johnson-Laird (1982) with both seven and eight year olds and college students. These researchers found that good readers used the clearer reference and conjunction to their advantage when recalling short researcher-created paragraphs, while poor readers did not.

Comprehension Measures: Several measures have been used to determine comprehension on tasks such as these. One common one is examining recalls - well organized pieces should be recalled more fully and have clearer connections between ideas (e.g., Meyer, 1984). Research (Kintsch, Mandel, and Kozminsky, 1977; Richgels, McGee, Lomax, and Sheard, 1987) suggests that good readers might reestablish in their recalls the coherence of a topic in a piece in

which paragraphs have been scrambled. Subjects in the Kintsch et al. study recalled information in a more plausible sequence of events instead of in its scrambled order.

Richgels et al. found that good sixth grade readers recalling scrambled comparison/contrast and problem/solution paragraphs recalled more main ideas than poorer readers; however, this ability to recall information well did not transfer to scrambled cause/effect paragraphs.

I chose a recall task to examine whether students could compensate for the poorly organized nature of scrambled material by providing a well structured recall for scrambled as well as ordered material.

I chose to use a verbal recall instead of a written one because it is difficult to measure whether differences between groups of good and poor writers on a written recall are a result of poor writing skills or of poor comprehension.

Judging Organizational Clarity: Another aspect of understanding organization in text is measured by having students judge the organizational clarity of a piece of writing. Garner, Slater, Alexander, Hare, Smith, and Reis (1986) have done this by asking third, fifth and seventh graders to evaluate text for its clarity after which they

were asked to manipulate it so that it became clearer.

In this aspect of the study, I wanted simply to ask students to explicitly judge a piece's organization. This particular aspect of the study also followed the work of Garnham, Oakhill, and Johnson-Laird (1984). In this task, students were asked to attach a numerical value to writing which varies in its organizational clarity. If students can observe and judge the differences between well and poorly organized text, then they are demonstrating the ability to measure how language and logic function to connect ideas.

Unscrambling Scrambled Paragraphs: Finally, I chose to measure students' ability to unscramble paragraphs. This task demanded an ability to judge the organizational clarity of scrambled paragraphs and to manipulate them until they were comprehensible. Therefore, this task combined aspects of the first two tasks, and further demanded the ability to use this knowledge to create new text. In this way, this task encompassed aspects of writing as well as reading; students revised text until they were satisfied with its organization. Garner and Gillingham (1987) provided students with a similar task to judge the aspects of organization students focused on during revision.

Describing Strategies Used in Performing Organizational Tasks: In recent years, there has been great interest in understanding the choices people make to help them gain understanding, particularly of difficult material (e.g.; Brown, 1980; Garner, 1987). This exploration of "metacognitive" processes has the potential to help teachers gain awareness of aspects of strategy usage helpful in grappling with text. For this study, I chose to interview students retrospectively about their use of strategies when performing each of the tasks.

Summary of Tasks Created: The tasks I chose measure comprehension, judgment, and ability to revise poorly organized text. The measures demand an ability to distinguish between well and poorly organized text and then, on two of the tasks, to use that ability to create more comprehensible text. If students can distinguish between varied levels of organized text, this, by itself, provides evidence of an understanding of elements of organization. If they can act on their knowledge to recreate clearer text than that found in what they are reading, that may show a greater potential control of organizational aspects of writing than is being shown in students' own writing. Beyond this, gaining an understanding of their articulated strategies may help us to respond appropriately when

teaching students to organize text.

Creating Paragraphs of Varied Levels of Organization: To gain an understanding of the effect of organization on readers, I needed to create several levels of organization within paragraphs. To do this, I followed Garnham, Oakhill, and Johnson-Laird's lead in creating three levels of text organization. Each paragraph would be presented in the following text conditions: 1) original paragraph (ordered), 2) paragraph in which sentences had been scrambled so that the main idea sentence is embedded in the paragraph and so that sentence-to-sentence cohesion is disrupted (scrambled), and 3) paragraph in which the ties between sentences in the scrambled version have been established by clarifying unclear references and by deleting transitional connectives which made relationships in the scrambled paragraph seem incomprehensible (reconnected).

An example of the methods used to vary text organization can be noted in Appendix A. Scrambling sentences can affect the macrostructure of the paragraph by embedding the main idea in the middle of the paragraph. For instance, placing the topic sentence, "Earthworms help to keep the soil in proper condition," (the first sentence in the ordered paragraph) as the fifth sentence in the

scrambled paragraph makes it harder to identify the cause and effect structure of this paragraph.

At the same time, certain information in the scrambled paragraph seems to refer to earlier information in the paragraph; however, the information being referred to no longer precedes this information as it did in the ordered paragraph. For example, in the first sentence in the scrambled paragraph, "As they search for food, some of the earth enters their mouths and passes straight through their bodies," they does not clearly identify what is searching for food. In the reconnected paragraph, this referential connection problem has been remedied by changing the pronoun, they, to the noun, earthworms, which clarifies the subject of the sentence and ultimately the paragraph. Thus, unclear references in the scrambled paragraphs have been made clearer in the reconnected paragraph. Moreover, an illogical connection is created by the connective phrase in this way in the scrambled paragraph: "Earthworms help to keep the soil in proper condition. In this way, the soil is ground up and kept from getting hard." The connective phrase is deleted in the reconnected paragraph. The resultant, "Earthworms help to keep the soil in proper condition. The soil is ground up and kept from getting hard," makes the interrelationship between sentences more

plausible. The reconnected paragraph, therefore, though lacking a macrostructure to tie ideas together, provides greater sentence-to-sentence clarity than the scrambled paragraph.

Choosing the Population to Study: To perform this study, I chose to work with ninth graders. I did this for two reasons. First, I teach high school students who read and write poorly and I wanted to gain a deeper understanding of their reading and writing abilities to provide quality instruction at the earliest possible moment to help them have a successful high school experience. Secondly, ninth grade is a good time to focus on organization in writing because the high school experience demands that students write many more expository pieces and fewer narratives than in earlier schooling. Organization in text is no longer primarily based on temporal sequence, but also on such factors as logical order.

My Research Questions: In creating this study, I focused on aspects of text organization which affect readers' ability to comprehend written information: macrostructure, cohesion, and text structure. I then built three tasks which tested students' ability to comprehend text demonstrating varying degrees of organization and a strategy interview to provide insight into the methods

students used to create meaning in poorly organized text. Finally, I chose a population with whom to explore issues of organization. From this exploration came four research questions which I have addressed in my study. They are as follows:

1. How well do ninth grade writers divided into groupings of good readers/good writers, good readers/poor writers, and poor readers/poor writers comprehend text which varies in organization?

2. Do these same groups of students perceive differences in text which varies in organization?

3. Can these same groups of students take scrambled text and reorder it to make it clearly organized?

4. What types of strategies do students use to help them perform each of these organizational tasks?

The purpose of having students read, analyze, and manipulate well and poorly organized material was to gain a better understanding of what they know about text organization when they read. The tasks described in these research questions varied in the degree of manipulation of text necessary to perform them. One of the tasks simulated one aspect of the revision process in writing: reordering sentences. This particular task suggests a possible bridge between the reading and writing process.

Chapter 3. Methodology of the Study

Subjects: My sample included 90 ninth grade students divided into three groups of thirty students based on a combination of their reading and writing skill. My three groups of interest included good readers/good writers, good readers/poor writers, and poor readers/poor writers.*

The students are from five high schools in a school district which I have given the fictitious name, "Raintown". The district is in a medium sized city in the Pacific Northwest and includes ten high schools and approximately 12,000 high school students.

All five high schools were in areas in which large numbers of working class students lived. Three of these schools received Chapter I funding in the year I conducted the study and another obtained it the following year. The other school is the District's technical high school which is quite selective, but includes students with a range of writing and reading skills. The racial mix in the high

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* Please note that I have not included the fourth contrasting group, poor readers/good writers, because the evidence suggests they are a small group of students. For instance, of the 766 ninth grade students who had completed our District's Direct Writing Assessment in Fall, 1987 and for whom we had reading and writing scores, only 21 (2%) had above average scores on writing organization and scores one year or more below grade level in reading.

schools is predominantly white with large subpopulations of black students at two of the high schools, and of Asian students at three.

Defining Reading Ability: Students were considered good readers if they scored at or above the average score for their grade level on the District-created Achievement Levels Test in Reading given in the Spring of their eighth grade year. These tests are re-normed each year in relation to all students at each grade level in the district. Students were considered poor readers in this study if their scores were at least one year below grade level.

Because I wished to calibrate the difficulty of paragraphs for my study to the reading level of my students, I chose to restrict the range of scores of my sample. I decided to use paragraphs at the sixth and ninth grade reading difficulty. Therefore, I wanted poorer readers in the study to be reading at the sixth grade level or above, while good readers should be reading at least at the ninth grade level. I chose my sample based on Spring, 1988 RIT* scores in reading for eighth graders. The average score for students entering the ninth grade in Fall, 1988 was 224; the

* "The RIT score is calculated from student responses to calibrated items. The calibration is done through Developmental Testing before items are used in the RALTs

average for those entering sixth grade was 211. My sample included poor readers whose scores ranged from 211 to 219. Good readers' scores ranged from 224 to 232, also an eight point range.

Within the eventual sample, the mean scores for each group showed virtual equality between good readers/good writers (mean, 228) and good readers/poor writers (mean, 227). The mean for poor readers/poor writers was 215.

Defining Writing Ability: Students' organizational ability in writing was gauged by their organization score on the District-created and administered Direct Writing Assessment. The assessment was given in February of 1988 to all eighth graders. The District analytically scored all writing samples using a trait-based rubric focusing on five aspects of writing including organization. Two readers read each essay independently and scored it on all five sub-traits using a scale from 1 - 5.

(Raintown Achievement Levels Tests). Using a statistical procedure called the Rasch Model (an application of Item Response Theory), items are related to each other in order of difficulty. Each item's difficulty is expressed in RITs (which is an acronym for Rasch Units). Thus, a student's RIT score reflects both the number of items he or she answers correctly and how hard those items are." (Parent-Teacher Guide to Raintown Achievement Levels Tests, Fall, 1988).

A separate rubric was developed to describe a prototypical 1, 3, and 5 paper for each sub-trait. The rubric for a 3 (middle range score) on organization from the District's Analytic Rating Guide begins "the writer attempts to organize ideas and details cohesively, but the resulting pattern may be somewhat unclear, ineffective, or awkward. Although the reader generally can follow what's being said, the organizational structure may seem at times to be forced, obvious, incomplete or ineffective." The more specific characteristics next mentioned include ineffective beginning and/or conclusion, placement of details at times out of order, transitions not always used effectively, and overall cohesion weak (see Appendix B for full rubric). A middle score, therefore, clearly shows some organizational deficiencies.

Within my sample, organization scores of good writers ranged from 3.5-4.5 (mean, 3.8) and of poor writers ranged from 1.5-2.5; good readers/poor writers' mean was 2.2, while poor readers/poor writers' mean was 2.3.

In order to assure that organization had a serious effect on the overall quality of the writing sample, I also used another measure to determine writing ability: a holistic scoring of the writing samples written for the Direct Writing Assessment. I gathered a large number of

these writing samples (600) reflecting the full range of writing in the eighth grade Assessment. The writing samples included, but were not limited to, potential participants in my study. Two district teachers trained in holistic reading participated with me in reading the writing samples judging them on a 1 - 4 scale.

Students who scored below average on both organization and the holistic reading were considered poor writers for this study. Students who scored above average on both organization and holistic scales were considered good writers.

Other Factors Affecting Inclusion in Sample: English teachers at participating schools were asked if students were native speakers of English and if they were of "normal" intelligence (the District does not administer I.Q. tests). If they were not native speakers or were judged to be of above or below normal intelligence, they were excluded from the study.

Potential students received a letter explaining the study and asking for parental permission. I received approximately one hundred signed permission slips for the study from whom I selected ninety.

Materials: Paragraph Selection. Twelve paragraphs were found in natural text and were minimally altered to gain

cause/effect paragraphs from those which had other structures. All twelve of the paragraphs I had chosen were chosen by both readers as cause/effect paragraphs. However, upon subsequent discussion, two of the potential paragraphs were found to lack a clear set of causal relationships between the topic sentence and the rest of the ideas in the paragraph. Therefore, I chose two new cause/effect paragraphs and showed each of these two paragraphs to my readers for approval.

The final twelve paragraphs achieved certain macrostructural equivalence. Each began with a topic sentence describing the overall result (effect) of the set of causes described in the paragraph. The sets of causes were then described, most in temporal and/or logical sequence. However, two of the paragraphs ("Earthworms" and "Acid Rain") described two separate sets of events which contributed to the overall effect and one ("Plains Indians") listed sets of causes of the initial effect without clarifying the interconnections between each of the causes. Additionally, two of the paragraphs were initiated by a question.

The paragraphs were controlled for reading difficulty level, number of sentences, and, for those being used on the recall task, for number of words (see Appendix C, Table 1).

equivalence in words, sentences, and/or readability when necessary. They all had a cause/effect text structure and were controlled for gross macrostructural equivalence. The paragraphs were found in social studies (4 selections) and science (5 selections) textbooks, and in comprehension paragraphs from various skill-building workbooks (3 selections). Seven of the paragraphs had a strongly scientific bent, four were clearly social studies passages and one, about acid rain, showed aspects of both.

I chose materials for this study using several different criteria. First, I wanted to find materials that are commonly read in school. I wanted natural text with all of its nuances, even if it proved true that specific passages did not act as similarly as passages which have been produced by researchers to make them equivalent. Therefore, I examined social studies and science texts as well as skills books (e.g., Reading Skills Builders, New Practice Readers) to find passages appropriate to this study.

After selecting twelve cause/effect paragraphs, I chose to confirm my judgment of the structure. To do this, I presented thirty six paragraphs of varying text structures including the group of twelve I had selected to two readers. The readers subsequently separated those which were

organization is to understanding what you read." I also explained that some of the tasks would be difficult and, for this reason, patience was important (for complete instructions, see Appendix D). The second comment was made to acknowledge the possible frustration of trying to recall material which has lost its focus due to scrambling.

Comprehension Task: At the beginning of the first task, the recall, students were told that they would be reading material, some of which would "seem clear", and other of which might "seem less clear".

In this task, students were asked to read material "until you've understood it as well as possible." Next, they were told that they would be talking into the tape recorder about "all the information you remember from the paragraph." Then, after being told that the first task was the most difficult (to mediate the possibility of frustration), students were told to "just take your time and let yourself remember as much as possible."

Next, students practiced by reading, then recalling two one sentence examples. The main intention of these examples was to get students used to manipulating the computer which went blank when a student hit the space bar, and to get used to doing a verbal recall. Sentences were used instead of short paragraphs to expedite the process.

To determine reading difficulty levels, the Dale-Chall readability formula was used. Paragraphs were chosen from the high range of the 5-6 reading level and from the low range of the 9-10 reading level. Paragraphs were minimally manipulated to maintain the same number of words and sentences when necessary. In addition, several of the paragraphs were adjusted minimally to gain an equivalent reading level. All paragraphs used in this study can be found in Appendix C, Tables 2-13 in their ordered, scrambled, and reconnected versions.

Description of Procedures while Running Study: To run this study, a piece of software was developed upon which students could read paragraphs for the various tasks, move sentences in the unscrambling task, and record data to be analyzed. At the suggestion of Carol Chomsky (conversation, 1983), I chose the computer format because it afforded a method to unscramble mixed up sentences that would allow students to read their successive revisions.

Students were tested individually in a private room which varied in size depending upon the school in which I was working. Each room contained a computer, a tape recorder, and chairs for one student and myself.

Before each individual session, I explained to students that they were "helping me understand how important

the bone") and presented it in its original form and in two scrambled versions ("Bone the dog chewed the"; and "The bone the dog chewed"). Piloting had suggested that students would rate the original sentence in the high range, the sentence beginning "bone" low and the third sentence in between. I used sentences as examples rather than paragraphs because I did not want to prejudice results in the task itself by clarifying what I considered to be a high, low, and middle rating for a paragraph.

As was the case with the recall task, students read a total of six different paragraphs, three at the 6th grade readability level, and three at the ninth. Once again, each set of three included an ordered, scrambled, and reconnected paragraph with every third participant seeing a particular paragraph (e.g., "Water Cycle") in the same text condition (e.g., ordered). Similarly, the order in which the paragraphs was seen was randomized within grade level and 6th grade paragraphs always appeared first.

Students recorded their ratings onto the computer program by striking the appropriate number key on keyboard immediately after reading each paragraph.

Unscrambling Task: The unscrambling task gave students a chance to revise four paragraphs that they had seen in the scrambled condition (one 6th and one 9th grade

Students read and recalled a total of six different paragraphs, three at the 6th grade readability level, and three at the ninth. Each set of three included an ordered, scrambled, and reconnected paragraph with every third participant seeing a particular paragraph (e.g., "Earthworms") in the same text condition.* The order in which the paragraphs was seen was randomized within grade level (the 6th grade paragraphs always appeared first).

Rating Task: The organizational clarity rating task asked students to read, then rate paragraphs for "how well organized they seem." Students were asked to rate paragraphs' organization on a 1-10 scale. On this task, I defined organization as "arranging things in a way that makes them clearer. When reading these paragraphs you might ask yourself to what extent ideas are arranged in an order that helps make information clearer for a reader."

For an example, I used one sentence ("The dog chewed

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* To control for the effects of multiple readings of the same material, each subject read no paragraph more than once. To illustrate, ten subjects from each skill group read the ordered version of "Earthworms", the scrambled version of "Glaciers" and the reconnected version of "Acid Rain", while a second group of ten subjects from each group read the ordered version of "Glaciers", the scrambled version of "Acid Rain", and the reconnected version of "Earthworms". The third group read the same three paragraphs with "Earthworms" being in the scrambled condition, "Glaciers" being in the ordered, and "Acid Rain" being in the scrambled.

were completed. For the strategy interviews, I developed four categories of questions (see Appendix E for complete set of questions). Three of them had to do with strategies used to complete each of the tasks (recall, rating, and unscrambling); the fourth examined students' perceptions of the effect of previous content knowledge and interest in topics found in the paragraphs on their ability to perform different tasks. Each set of questions was further elaborated upon by the interviewer to probe for greater specificity in answers. The interviews were done orally and later transcribed for analysis.

Procedures for Scoring Verbal Recalls: All verbal recalls were transcribed to allow scoring of the protocols. Transcribers were instructed to include all information with the exceptions of irrelevant interjections such as "um".

I wanted to gain a measure of both the content and the organization of the verbal recalls. Several methods for measuring the number of ideas have been used by researchers (e.g., Armbruster, Anderson, and Ostertag, 1987; Johnson, 1970). These measures, called propositional analyses, weight ideas in the order of their significance to the topic. Recalls are scored on the basis of the number and significance of the ideas included in the recall. Propositional analyses by themselves, however, give no

paragraph from each of the two previous tasks) to make them clearer. Students were told that they "would be placing mixed up sentences in an order that makes sense to you." Later in the instructions they were told to "move sentences as many times as you wish until you are satisfied that the paragraph is organized in the best way for understanding the information."

All sentences in the paragraph were numbered and students were instructed to "move sentence _ in front of sentence _," each time they wished to change the positions of the sentences. Each time they moved a sentence, the computer would automatically switch the position of each of the sentences and the student would be able to read the new revision of the scrambled sentences. They could, then, make further moves until the students felt comfortable that the paragraph was clear. The computer program recorded each move made by each student as well as the final order of each paragraph.

Each student was given an example of a three sentence scrambled paragraph to unscramble to make the method of moving sentences more concrete.

Strategy Interviews: Students were told in the introductory instructions that they would be discussing the strategies they used to do the three tasks after the tasks

scored each of the 90 recalls of this paragraph. They, then, proceeded to the next 6th grade paragraph and followed a similar process. All 6th grade paragraphs were read before going on to read the ninth grade paragraphs. Five hundred and forty recalls were read in one day.

Procedures for Scoring Unscrambled Paragraphs: The task in reading the unscrambled paragraphs was similar to that of reading the recalls. However, it differed in two essential ways: 1) all students were working with the same material; the same words and sentences would be in each paragraph. Therefore, the paragraphs would differ solely on the basis of the order of the sentences; and 2) there was a prototypical well-formed paragraph-the original paragraph. It was assumed, however, that there could be other potential reorderings of each paragraph which would maintain the essential meaning and integrity of the paragraph. It was also posited that there would be levels of coherence associated with the different attempts to restructure the scrambled paragraphs. A coherence rubric was developed based again on a 4 point scale with 1 being "incoherent" and 4 being "highly coherent". Placement of main idea as well as clarity and accuracy of connection between all ideas in a paragraph defined the parameters for scores at each level of the rubric (see Appendix F). Again readings were done

measure of the organizational aspects of a recall and I felt that a holistic scoring approach focusing on both content and organization would provide a gross measure of both areas of interest.

I chose as my model for scoring these verbal recalls a combination of holistic and analytic scoring techniques. A rubric was developed based upon the ideas posited in the recalls and the way in which those ideas were interconnected. Readers read each recall holistically basing their judgment on two aspects of the recall - content and organization. Recalls were scored on a scale of 1 (poorly constructed) - 4 (well constructed).

To develop the rubric, my two colleagues and I read a large sampling of the recall, including samples from each of the six involved paragraphs. A rubric was subsequently developed for each of the 4 possible scores (see Appendix F). Readers were asked to ignore common elements of oral language such as self repairs which interfere with the flow of the text, but which do not alter either the overall organization (macrostructure) of a piece or its accuracy and completeness.

To prepare for reading each paragraph, readers first read the original paragraph (e.g.; "Earthworms") and discussed the essential elements of that paragraph, then

read all interviews and indicate which students had reported using each strategy (see chart).

We read all strategy interviews in one day focusing on one set of questions at a time: first, recall strategies, then rating strategies, and finally, unscrambling strategies. At the beginnning of each of these rating sessions, we would read nine responses, three from each ability group, and, then, score them. Next, we would discuss our categorizations and come to agreement on them. Finally, my two colleagues would read the remaining responses for the task using these discussions as a basis for agreement on what constituted, for instance, a topic based strategy for understanding and recalling paragraphs. The agreement on strategies was not extraordinarily high (it ranged from 40% - 67%). Therefore, I chose only to count a person as practicing a particular strategy if both readers agreed on the strategy.

holistically based on the sub-traits discussed in the rubric.

For this session there were renditions of twelve different paragraphs to be judged. One paragraph had only eight different versions after the unscrambling, while another had thirty one inclusive of the original paragraph. The average number of versions was nineteen. Readers read a total of 231 unscrambled paragraphs.

As in the recall task, readers read all versions of one paragraph before going on to another. Paragraphs were read in groups of three: first, sixth grade recall paragraphs; second, sixth grade rating paragraphs; third, ninth grade recall paragraphs; and finally, ninth grade rating paragraphs. Readers differed by more than one point on seven of the 231 unscramblings. I acted as the arbiter in those seven cases.

Procedures for Evaluating Strategy Interview Protocols: To score the strategy interviews, my two colleagues and I first read a sampling of protocols including some from each ability group noting what we felt were categories of comments for each set of questions. We, then, talked together about the varied strategies that students seemed to use to attack each task. After this discussion, I formalized the set of categories so that we as a group could

on the holistic/analytic scorings based on content and organization. The analysis involved a 3 (ability groups) x 3 (text conditions) x 2 (passage difficulty) between groups repeated measures ANOVA design. Significant main effects were found for ability group, $F(2, 87) = 10.80$, $p < .001$, passage difficulty, $F(1, 87) = 4.78$, $p < .03$, and text condition, $F(2, 87) = 17.99$, $p < .001$. All interaction effects were not significant (see Appendix G, Table 1).

Effects Involving Differences between Ability Groups: Good readers/poor writers recalled paragraphs better than poor readers/poor writers, but not as well as good readers/good writers. I had hypothesized that good readers/poor writers would act more like good readers/good writers when reading well organized text, but more like poor readers/poor writers on the two poorly organized text conditions. This hypothesis was given limited support. On the sixth grade ordered paragraphs, good readers/poor writers recalled material similarly to good readers/good writers (see Appendix G, Figure 1). However, when viewing their performance as a whole, good readers/poor writers did not perform as well as good readers/good writers on any of the three text conditions, while they outperformed the poor readers/poor writers (see Appendix G, Figure 2).

The recall task provides evidence that good

Chapter 4. Results of the Study

The results of this study will be discussed in terms of the original questions posed to be examined. First, I had hypothesized that reading comprehension would be disrupted by scrambling paragraphs, though I had suggested that paragraphs which had been reconnected would be more comprehensible, particularly to good readers/good writers. Second, I had expected that scrambling of paragraphs would cause readers to judge them to be of lesser organizational clarity. Finally, I had suggested that good readers would perform better than poor ones on the task of unscrambling scrambled paragraphs. In the discussion below, I will examine the results of the study including its anomalies more closely.

All statistical calculations for this analysis were done using SPSS-x 2.2. F statistics for 2 and 3 way ANOVAs were calculated using Wilk's Lambda.

What Is the Effect of Text Organization on Reading Comprehension?: My first research question asked how well the three ability groups would comprehend text which varied in organization. This question was addressed by measuring recall. Students orally recalled each of six paragraphs they read for this task. Analysis was done using the scores

Taken as a whole, poor readers/poor writers demonstrate a smaller range of mean scores (see Appendix G, Table 2) between text conditions than the other two groups. Though they score slightly higher in organized text than on the other two text conditions, their recalls of all three text conditions are much more similar than good readers/good writers and good readers/poor writers. This is not a surprising finding as it should be more difficult for these students to pick up the relationships between information in all text.

I had hypothesized that good readers/good writers would make distinctions between reconnected and scrambled text not made by the two poor writer groups. This prediction was generally borne out. Good readers/good writers seemed better able to give structure to poorly organized material than poor readers/poor writers and good readers/poor writers. The difference was especially broad in the recalls of reconnected text (see Appendix G, Figure 3). (This difference would likely have even been larger if the paragraph about glaciers had not been equally incomprehensible across text conditions -- see discussion of this paragraph below). Good readers/good writers also demonstrated a trend towards recalling reconnected text more easily than scrambled, whereas the other two groups did not.

readers/good writers are better at recalling text in all text conditions than poor readers/poor writers. As hypothesized, good readers/good writers performed better than poor readers/poor writers ($p < .0001$). Examining Figure 1, Appendix G, it can be seen that there is a difference of 17% in mean scores across all text conditions. Therefore, whether text was well or poorly organized, good readers/good writers showed greater ability to recall information.

The difference in performance between good readers/good writers and good readers/poor writers also approached significance ($p < .058$). Good readers/good writers and good readers/poor writers were nearly equal in their recalls of organized paragraphs at the 6th grade level (see Appendix G, Figure 1). However, at the 9th grade level, a 13% difference in mean score develops (see Appendix G, Figure 2) which may suggest that when material gets more difficult, good readers/good writers respond more fully and/or clearly on their recalls than good readers/poor writers.

The difference between recalls of different ability groups continues across all text conditions with the good readers/poor writers demonstrating significantly better recalls than the poor readers/poor writers ($p < .008$), but poorer than the good readers/good writers.

expectations, means for each separate paragraph were examined. This analysis revealed that mean recall for the paragraph about glaciers (m = 1.8) was significantly lower than those for the other two sixth grade paragraphs (earthworms, m = 2.5; and acid rain, m = 2.3). In addition, there was little difference between the mean scores of recall protocols on any of the text conditions of the glaciers paragraph (ordered, m = 1.9; reconnected, m = 1. 8; scrambled; m = 1.8) while those of the other two paragraphs showed differentiation, particularly between ordered and scrambled text conditions (see Appendix G, Table 2).

Comparisons of the combined mean of the two other sixth grade reading level paragraphs (m = 2.4) and the combined mean of the ninth grade paragraphs (m = 2.3) revealed that students' performance on these sixth and ninth grade paragraphs was much more similar. In addition, instead of students having greater difficulty on the sixth grade paragraphs, the trend is slightly toward the ninth grade paragraphs being more difficult.

A post-hoc reading of the glaciers paragraph suggested that a technical term central to understanding the text, cirque, and an ambiguous referent in the text may have combined to make this paragraph more difficult than expected.

In summary, good readers/good writers were the most successful group when recalling text. Both groups of good readers demonstrated greater performance than the poor readers/poor writers. Good readers/good writers distinguished themselves most from the other two groups in their recalls of reconnected text giving support to the hypothesis that good readers/good writers are more sensitive to the importance of cohesive ties to creating organization in writing.

Effects Involving Different Text Conditions: Results from the recall task suggest that organization of text has an effect on its comprehensibility. As hypothesized, the difference between the ordered text condition and the two other text conditions was clearcut ($p < .0001$ on both contrasts - see Appendix G, Table 1). However, the differences between the scrambled ($m = 2.2$) and reconnected ($m = 2.1$) text was minuscule. Within ability groups, as noted above, there was one exception to this trend and this was among good readers/good writers at the sixth grade passage difficulty level.

Effects Involving Passage Difficulty: The passage difficulty main effect suggests that the sixth grade paragraphs are recalled with less ease than the ninth grade paragraphs. Because this result was contrary to

1).

Explanation of the Interaction between Group and Text Condition Effects: The group x text condition interaction was not unexpected as I had hypothesized that good readers/poor writers and poor readers/poor writers would have difficulty distinguishing between two of the text conditions*, while good readers/good writers would judge ordered > reconnected > scrambled text. Univariate F tests (see Appendix H, Table 1) show that the interaction is based on the poor writer groups finding reconnected and scrambled text equally poorly organized, while good readers/good writers found reconnected text to be better organized than scrambled ($p < .043$). As can be seen in Appendix H, Figure 3, poor readers/poor writers judged scrambled > reconnected, good readers/good writers judged scrambled > reconnected, good readers/good writers judged scrambled equivalent to reconnected, and good readers/good writers judged reconnected > scrambled. It should be noted that readers/good writers' differentiation between reconnected and scrambled text existed mostly at the sixth grade level

* I had hypothesized that the two groups of poor writers would rate reconnected text equally to ordered based on a focus on sentence-to-sentence connections instead of the global meaning. I was proved wrong. Poor writers, instead, focused on differences in global meaning and, as noted above, found little differentiation between reconnected and scrambled text.

How Do Students Rate the Organization of Well and Poorly Organized Paragraphs?: Students were asked to examine and rate paragraphs for their organizational clarity. Analysis of the organizational clarity task was done by examining the scores given by students in which they rated paragraphs from 1 (very poorly organized) - 10 (very well organized). The analysis involved a 3 (ability groups) x 3 (text conditions) x 2 (passage difficulty) between groups repeated measures ANOVA design.

A significant main effect was found for text condition, $F(2,87) = 60.739$, $p < .001$. The group effect, $F(2,87) = .42$, $p < .658$, was found to be not significant. However, a significant interaction effect for group x text condition $F(2,87)$ 8.199, $p < .001$) suggests that there are differences in how each group responded to the task (see Appendix H, Table 1).

Effects of Text Condition on Ratings: I had hypothesized that ordered text would be rated as most clear and that reconnected text would be rated as better than scrambled. However, the text organization effect is explained solely by the difference between the ordered text condition on the one hand, and the reconnected, $F(1,118) = 74.363$, $p < .0001$ and scrambled, $F(1,118) = 94.71$, $p < .0001$, text conditions on the other (see Appendix H, Table

all levels are sensitive to the importance of material being organized around a central topic and of, as many of them suggested, the paragraphs "making sense". Disrupting the macrostructure, then, did impact on all subjects suggesting that all students can distinguish between well organized and grossly out of order text. (However, poor readers/poor writers made smaller distinctions between well organized and poorly organized material at both difficulty levels.) At the same time, good readers/good writers show greater sensitivity to the organization created by cohesive ties than do the two groups of poor writers.

How Do Students Perform when Unscrambling Scrambled Paragraphs?: Students each unscrambled four paragraphs that they had seen in the scrambled text condition in the comprehension and rating tasks. Analysis for this task was done using the scores on the researcher-produced coherence protocol. The analysis involved a 3 (ability groups) x 2 (# of sentences) x 2 (passage difficulty) between groups repeated measures ANOVA design.

Significant main effects were demonstrated for ability group, $F(2,87) = 5.09$, $p < .008$, number of sentences, $F(1,87) = 23.93$, $p < .001$, and passage difficulty, $F(1,87) = 15.51$, $p < .001$. There were no significant interaction effects (see Appendix I, Table 1).

(see Appendix H, Figure 1); their ratings of ninth grade reconnected and scrambled text were nearly equivalent (see Appendix H, Figure 2).

Therefore, while all three groups seemed sensitive to the importance of organization based on creating a clear macrostructure, poor writers did not seem as sensitive on sixth grade paragraphs to the sentence to sentence links created by cohesive ties.

Effects of Passage Difficulty on Ratings: It was expected that students would rate ninth grade paragraphs lower on the basis of their greater difficulty. Means (see Appendix H, Table 2) suggested a trend in the direction of ninth grade paragraphs being more difficult; however, the trend was not significant ($p < .098$). Apparently, even when material got more difficult, all three ability groups could detect the effect of disrupting the macrostructure of the paragraphs; in this case, therefore, organizational factors seemed to be more salient than passage difficulty.

To summarize, results from the rating task showed similarities among all groups reflected in the lack of a significant main effect for group. Yet, there were differences as well. All three groups distinguished between well organized and scrambled text, whether reconnected or not. This significant difference suggests that students at

expected result. Recreating a well organized paragraph in material whose content was more sophisticated was harder for all students (and in this case, this was true even with the results on the glacier paragraph, which again was very difficult, included in the analysis).

Discrepancies between Paragraphs within the Unscrambling Task: Mean scores for coherence on the four point scale ranged from 1.6 for "Glaciers" (a sixth grade, seven sentence paragraphs) to 3.3 for "Jellyfish" (a ninth grade, six sentence paragraphs). Though overall indications showed that ninth grade unscramblings were more difficult than sixth, and that seven sentence unscramblings were harder to unscramble than six, still no consistency between paragraphs was found within either of these categories (see Appendix I, Table 3). Sixth grade paragraphs, as well as seven sentence paragraphs, ranged from 1.6 ("Glaciers") to 3.0 ("Acid Rain") while ninth grade as well as six sentence ranged from 1.7 ("Agricultural Depression") to 3.3 ("Jellyfish"). Therefore, even though I controlled for various factors to maintain equivalence between paragraphs, other issues such as content seemed more relevant.

What Strategies Did Students Use to Accomplish Tasks?: Students were asked a series of questions after they had performed all tasks which were analyzed to ascertainthe

The unscrambling task was difficult for all three groups. Results of the attempts to reorder paragraphs varied widely, but the average coherence of paragraphs after manipulation (m= 2.4) demonstrated a lack of complete control on the part of all three groups. Given this statement, it is still important to note that there were no significant differences between good readers/good writers and good readers/poor writers, while they both did significantly better on the task than poor readers/poor writers (see Appendix I, Table 2).

The equivalence between the two groups of good readers was unexpected. I had hypothesized that good readers/poor writers would not revise the paragraphs as well as good readers/good writers based on good readers/poor writers' poorer editing skills when writing their own papers. The actual result reinforces information found in the rating task that good readers/poor writers are sensitive to the importance of clear macrostructure to clarifying meaning.

Six sentence paragraphs were significantly easier to reconstruct than seven ($p < .0001$). This might be expected simply because there are fewer possible permutations in paragraphs with fewer sentences. Similarly, sixth grade paragraphs were easier to reconstruct than ninth ($p < .0001$). On this task, then, passage difficulty showed the

category of responses is word based and therefore, might not be interpreted as topic-oriented, the previous comments demonstrate a concern for capturing the important concepts in the sentences and paragraphs through the key words.

At the same time, another sixth of the students spoke of finding the main ideas and/or topic and organizing their recalls around this. Typical comments included, "well, I read it over a couple times to make sure I was getting the main idea of the paragraph" and "(I remembered) the most important things followed by the least important things."

If one accepts that the first two categories focus on important concepts and are, therefore, topic based, over half of this sample utilized a strategy which emphasized major concepts.

All three groups were essentially equal in the number of students discussing one of these two strategies, though good readers tended to mention key words more often and poor readers spoke more of finding the main idea.

This attention to major concepts contrasts with simply remembering the information verbatim. Those simply remembering fell into two categories: those who seemed to lack a consciousness of what they were doing (e.g.; " (I remembered) by reading over and remembering what it said,") and those who consciously worked to memorize the material

types of strategies employed during each task. The process through which my co-workers and I analyzed the strategy interviews was deterred by a lack of high interrater agreement on categories in which to place student responses. Therefore, I have chosen to discuss possible trends in the data based on those responses which received agreement from both raters. This discussion then is merely suggestive of trends. Further investigation of the strategy interviews is warranted.

Strategies Used during Recall Task: On the recall task, over half the students could articulate conscious strategies used to recall material. The strategies seemed aimed at defining main ideas through finding and remembering the significant content. Two types of responses were defined - one being "key words", the other "topic-oriented" responses. About one third of the students spoke of looking for key words related to the topic. These key words ranged from dates and names to words associated with the topic. Students' responses in this category ranged from "well, I looked for like key words - like if it was a certain date ...or a certain word or something like protozoans... or some word that I didn't know about," to "... it was the main words in the sentence," to "(I remembered) the facts and the most important sentences." Though the focus in this

A small number mentioned finding the main idea or topic and proceeding from there. One stated: "You just kinda looked down 'cause, like all the sentences had one main thing they were talking about. You just based it off of that." Another student, who clearly monitored his/her own performance, noted, "I just tried to remember the main point, like I said, but those (confusing or out of order paragraphs) were the ones that I forgot, like, I was mixed up and I couldn't remember what was happening."

One sixth of the sample suggested that they just remembered the information in its out of sequence order (e.g.; "I just tried to remember as much... it's too confusing so I just remembered as much as I could," and "That was hard. I don't know. I just... basically, I just tried to remember what the computer said and then I tried to record it on the tape, but it didn't really work out that well 'cause I got confused.") As noted in the above examples, many of the students were aware of the inadequacy of their response to the task, a good sign, though not as efficacious as an attempt to reorder information into a more coherent pattern.

Several students responded that they didn't notice that information was out of order. Overall, only about a quarter of the sample was judged by both raters to express a clear

verbatim (e.g.; "I would read each line like three times and then go on to the next one, just to see if I can remember it and when I was done I would like see if I could remember what I read.") I have categorized these two responses, one which seems strategic (memorization) and one which doesn't (just remembering), together because the practical effect of both responses would be to recall material without attention to the incongruities caused by poorly organized text. About a sixth of the students described using this method of recalling information. Raters were unable to agree on the category of response on the final sixth of the sample.

When students were asked what they did when information seemed confusing or out of order, they seemed to have difficulty articulating their strategies. Less than a half of the students were scored by both raters as describing one of the following methods clearly.

The most commonly used strategy was for the reader to place ideas or sentences from a passage in a clearer manner in her/his mind (e.g.; "I put it in order and remembered that way," and "I just, first I read the whole paragraph, and then I kinda like switched the lines around to see if it made any difference, and I read it like that"). About 20% of the sample employed this strategy.

through and the details would be first, explanations last," and "If at the beginning..., it just started out right away and you don't know what they're talking about. That ... was one thing I didn't, that I marked down for." Sometimes, then, comments were directed towards paragraph structure (i.e.; main idea, details) and sometimes towards the general amorphousness of the topic.

Over one third of my sample, many of them good readers/good writers, spoke of ideas being out of order. Typical comments ranged from "(I could tell something was poorly organized by) whether it would go from one thing and then have nothing to do with it and just go to another thing; it'd just be, why is that there?" to " 'cause you can tell by the way the sentences are switched around...'Cause like one of them it had how water evaporates in the beginning of the sentence and then the next sentence after that talked about the sun and then it had a couple more about water and then the last one was about sun, and I thought the suns should be together."

About a quarter of the sample simply referred to information not making sense in making their judgment of a piece's organizational quality. The greatest number of these students were poor readers. For instance, in responding to how he judged well or poorly organized

strategy for working with poorly organized material. Clearly, the lack of organization in the paragraphs made the process of remembering and the strategies to do this more difficult.

Strategies Used during Rating Task: Responses to the strategy questions for the organizational rating task were categorized into three types of judgments made by students: students judging if the paragraph made sense to them, students feeling that the main idea was clearly out of order or that the topic was unclear, and students speaking of ideas being out of order or the information skipping from topic to topic.

Over two thirds of my sample articulated a strategy used to judge a paragraph's organization. Responses ranged from clear descriptions of why students chose to rate material well or poorly organized to more general responses which simply found material to make sense or not make sense without being able to describe the reason.

A small number of students, most of whom were good readers spoke of the topic being disrupted. Comments related to this strategy included, "Well, if it was well organized, it would have the main topic and then it would go into detail and things would follow after it and if it was bad, then usually the topic wouldn't come up until half way

distinguished a mid range rating from a poorer one required too much explanation to clarify during the interview and, therefore, responses to this question were read simply for further clarification of the strategies students used.

Many students from each ability group were sensitive to the organization of the paragraphs they read. Over half were able to articulate, often through example, problems with the text's organization. Good readers were better able to describe the organizational problems posed by the text than poor readers. However, all were clearly groping towards the importance of text making sense and almost all recognized that in some paragraphs something was awry.

Strategies Used during Unscrambling Task: Students demonstrated less ability to clarify strategy usage on the unscrambling task. This is, perhaps, not surprising because students seemed to have greater difficulty on this task than on the other two (see results section, p.). Better than a third of the sample suggested that they first found the topic sentence, moved it into place, then moved other sentences. Several students spoke of placing a question first - a special case of topic sentence. Therefore, over 40% of the sample relied on a topic-based strategy, at least some of the time.

Some of these commentaries were quite specific in

material, one student said: "If I could understand it," and after further probing, he responded, " Just the way it sounded - if it sounded funny. It didn't sound right the way they were put..." This student could not go beyond the recognition that something didn't make sense to describing what it was that made the paragraph "sound funny". Some of these students did, however, grope towards describing material as being out of order (e.g.; "Well, I mean just the way it comes to you, I mean it seems like you can look at something and you can just tell, I mean, if something's wrong or if it's right. It just, it sounds funnier, you know, it doesn't make sense or..." followed later, after the question about how to differentiate between a poorly organized paragraph and one which was in between well and poorly organized, by "well, they weren't so bad, I mean, some things you could understand and they were in order, but then other things that should be at the start were at the very end of the paragraph. So, it's kind of in the middle, I mean, half of it was organized and half of it wasn't.")

Students were asked if any words helped them to rate the organization of each paragraph. Students who mentioned using words in helping them make judgments spoke mainly of temporal connectives with some discussing specific pronouns and their lack of antecedents. A final question about what

corresponds to actual performance on the task. Forty percent of poor readers were judged to have overly general or indeterminate responses which contrasts with only ten percent of the good readers.

Summary of Results of Strategy Interviews: The interview protocols suggest that students were clearest in response to the tasks which were the easiest for them to do, recall ordered material and judge the organization of well and poorly organized paragraphs. Good readers were generally more articulate in their descriptions of strategies, yet poor readers were able to articulate concerns about, for instance the fact that a particular piece did not make sense.

On the recall task, students found it relatively easy to talk about the strategies they used to remember material as long as it was well organized. However, when asked to describe how they remembered material when it was out of order, students' responses were much less lucid. This lack of ability to clearly articulate strategies was also found on the sentence reordering task.

Summary of Results: The results of this study suggest several differences among ability groups. Both groups of good readers displayed greater skill than poor readers on both recall and unscrambling tasks. Good readers,

describing how order was created (e.g.; "Well, first I would look and see if there was a good topic sentence and I would put it there and then I would sort of list things in order which I thought they would come by importance and/or if it was talking about the same thing in two or three sentences, I would try to put those all in one group; things like that."). On the other hand, some of the commentaries remained quite general when describing order (e.g.; "Well, I just read all the sentences and then like I, I figured out what the topic sentence would be, and then, if it wasn't at the top, I would move it, and then like if there was a sentence that, and then like, like it was number two and then like the one that should've been after it was like number six or seven, then I'd move it up there, and then I'd just read all through it when I was done to see if it all went together like a paragraph.")

Commentaries often involved a combination of finding the topic sentence and relying on logical or temporal connectives (i.e., although, then, dates) to help order paragraphs. Over a quarter of respondents mentioned using connectives or other logic-based methods of determining order.

Good readers were better able to articulate their strategies on this task than poor readers. This finding

varied effects depending on the task. On the recall task ninth grade paragraphs were recalled more easily than sixth; on the rating task, no difference was found between the ratings of the two difficulty levels; and on the third task, unscrambling paragraphs, sixth grade paragraphs were found easier to unscramble than ninth. It will be left for the discussion section to try to iron out the seeming contradictory evidence in relation to the overall effect of passage difficulty in this study.

Strategy interviews pointed to greater ability to articulate strategies among the good readers while also suggesting that clear articulation of strategies was more often found for the tasks upon which students performed best.

therefore, were more skilled at performing the tasks which demanded manipulating information.

At the same time, the two groups of good readers were separated on the basis of their writing ability when recalling ninth grade paragraphs - a difference which approached significance. The rating task, while not demonstrating a significant main effect due to ability group, did display an interaction effect which indicated that good writers rated reconnected higher than scrambled, whereas the two poor writer groups did not distinguish between reconnected and scrambled paragraphs. The difference found between good readers/good writers and the other two groups when recalling reconnected and scrambled text at the sixth grade level gives further support to the possibility that good readers/ good writers show greater sensitivity to the role that cohesive links play in making text more comprehensible.

On the two tasks, recall and rating, in which text organization was measured, it was found that ordered text was easier to recall and was considered better organized than either reconnected or scrambled text. Reconnected and scrambled text were not, however, found to be significantly different by the overall group.

Paragraph difficulty measured by readability showed

Chapter 5. Discussion of The Study

The overall results show a distinct difference between good readers/good writers and poor readers/poor writers on all three tasks. Good readers/poor writers, as might be expected, show themselves to act more like good readers/good writers on some aspects of each task and like poor readers/poor writers on others. The one place in which there was convergence among all three groups was in their ability to differentiate between well and poorly organized writing in the rating task, though, of the three groups, poor readers/poor writers were least sensitive to the differences.

Ordered text, as would be expected, was found to be easiest to understand in the recall task and was rated as the most clearly organized by all three groups. The hypothesized differences between scrambled and reconnected text were given some support in the performance of the good readers/good writers, and it was here that differences between good readers/good writers and good readers/poor writers were clearest.

In this discussion section, I will examine several issues made prominent by the results of the study. First, I will discuss differences between groups based on reading

ability. Next, I will discuss differences based on writing ability. I will, then, proceed to issues of content and organization brought forward by the ways in which paragraphs which were supposed to function as equivalents actually demonstrated differences. Finally, I will discuss possible reasons why projected passage difficulty did not always act in the expected manner.

Differences between Groups Based on Reading Ability:

All readers were able to judge the difference between well and poorly organized text. All groups agreed that ordered text was better organized than either scrambled or reconnected. This finding suggests that most ninth grade readers understand the function of organizing material so that it "makes sense". This is further reinforced by students' comments during the strategy interviews.

What separates good readers from poor ones, however, is their ability to use their knowledge of organization to help them recall and unscramble text. While poor readers could say "this doesn't make sense", they had great difficulty using this information to restructure information into more comprehensible text. They were less able to act on their understandings than either group of good readers. Perhaps, this is what separates good from poor readers on this task - a sense of being able to interact with text to make it more

comprehensible.

Good readers demonstrated an understanding of how to go beyond descriptions of things "not making sense" to being able to manipulate text to make it more organized. Good readers, then, were able to isolate organizational factors in text to gain greater understanding of the text. Poor readers, on the other hand, were less able to respond to the lack of organization they perceived.

Several of my good readers noted that they tried to place sentences in a more comprehensible order when they recalled text. Researchers (e.g., Garnham, Oakhill, and Johnson-Laird, 1982; Meyer, 1984; Richgels, McGee, Lomax, and Sheard, 1987) have noted good readers' search for meaning in text which is scrambled. They have suggested that good readers change the order of text in recalls to reflect greater logic. They suggest that good readers expect authors to be attempting to make sense and, therefore, are willing to manipulate text to bring meaning to it, even if it is disordered.

Do poor readers know that they, too, can change text to help them clarify material? Palincsar (1984) found that, in reciprocal teaching, clarification questions (questions in which the student responds to difficulties based in the text) were the hardest to formulate of the four types of

questions taught.

In my own experience working with reciprocal teaching, this is particularly difficult to do when the clarification is necessary because of problems in the way material is presented by an author. Students with reading problems can ask what a vocabulary word means, but they have great difficulty examining problems with an author's "inconsiderate" text. They expect that an author writes comprehensible prose and, therefore, tend to blame themselves for any lack of understanding. In other words, poor readers often do not engage in an active interpretation of text through which they can decide whether the problem resides within themselves or the text.

There is a difference, then, between knowing that material does not make sense and knowing how to give meaning to the material. And good readers, no matter their writing skill, have the ability to respond to text, to manipulate it both to gain greater meaning from it and to organize it in a more comprehensible manner. This reality suggests the possibility of using good readers/poor writers' embedded knowledge of text organization to help them better revise their own writing. Poor readers, on the other hand, must learn to put words to their sense that organization is lacking in scrambled writing. They must also learn that

they, too, can interact with poorly organized material so that they can gain greater understanding from it.

Comparing Good and Poor Readers Performance on Material Which Is Equally Difficult: An argument can be made that comparing poor readers to students who read better on paragraphs which are above the poor readers' reading level is unfair. I, therefore, employed paragraphs at or below the reading levels of both good and poor readers in this study. Did poor readers fare as well on sixth grade paragraphs as good readers did on ninth? The answer is no, across all tasks. On the holistic recall score, the average good reader's recall of ninth grade material showed a score of 2.5 (out of 4) compared to a 1.9 for poor readers on sixth grade material. In addition, while good readers' scores went up on ninth grade recalls, poor readers' remained equal.

There was less of a skill difference on the task which measured ability to judge the organizational clarity of a piece. Here, poor readers reading sixth and ninth grade paragraphs judged scrambled material to be better organized than reconnected, while good readers judged them to be equally disorganized at the ninth grade level. Good readers' unscramblings of ninth grade paragraphs received a mean score of 2.3 while poor readers' unscramblings of sixth

grade paragraphs received a score of 2.1.

In summary, differences between poor and good readers were found when comparing performance on paragraphs matched to the reading ability of the students. Differences between good and poor readers were more pronounced on the recall measure than on ratings or unscramblings.

Differences between Groups Based on Writing Ability: I have argued in Chapter 1 that there may be, for some students, an understanding of text organization which lies dormant when they write their own material. I have also posited that students who are judged good readers, but poor writers are the students most likely to demonstrate this ability without transferring it. The results of this study bear out these suppositions to a large extent. Ninth grade good readers/poor writers seem to have a better understanding of organization than they often use in their own writing.

In particular, as noted before, good readers/poor writers have the ability to determine when material is organized around a topic and to reorder scrambled paragraphs to reflect this organization. They also seem aware of the importance of the given-new contract (Clark and Haviland, 1974) which demands that information which is related be placed together. Therefore, these students seem aware of

global organizational factors. And yet, they do not always apply this information in their own writing.

That good readers/good writers and good readers/poor writers function equally on the unscrambling task suggests that they both can reorganize material in a manner that pays attention to a clear macrostructure. Poor readers/poor writers seem, on the other hand, to lack a sense of the importance of central focus; on the unscrambling task, they seemed to find several ideas that went together and, then, proceeded onto the next paragraph.

While all good readers in this study seemed able to focus on global aspects of organization equally, not all demonstrated the ability to structure recalls at the ninth grade level and to focus on the importance of cohesive ties to the overall coherence of material. It is here that students divided themselves based on writing ability.

Differences on Recalls: One area in which good writers differed from all poor writers was on their ability to recall paragraphs at the ninth grade level. All good readers had been expected to perform equally, at least on the recalls of the ordered versions of the paragraphs. However, at the 9th grade level, good readers/poor writers performed poorly in relation to good readers/good writers, though better than poor readers/poor writers. This

unexpected difference suggests that when material gets more difficult, good readers/good writers respond more fully and clearly than good readers/poor writers.

This finding might be seen as one which calls into question the results of the test used to determine the reading level of subjects in this study -- Raintown's Achievement Levels Test in reading. According to this test, both groups of good readers comprehend material equally. However, different results can be expected on a recall task which relies on students' organizing and choosing information to report than on a task in which students fill in answers to multiple choice questions about reading passages; recall is different from recognition (Valencia and Pearson, 1987).

In addition, scoring of protocols on the recall measure was based not only on students' ability to retrieve information, but also on their ability to concatenate that information in a well organized manner. One of this study's premises was that students who are good readers may not actually all be alike. And, although I chose to have students recall information orally to eliminate the effect of differences in writing upon the results, it may be that good readers/poor writers have difficulty organizing information regardless of the testing format.

In summary, these data suggest the possibility that good readers may be separated from poor readers in their ability to recall more significant content, and that good writers may be separated from poor writers based on their organizational abilities. However, this hypothesis awaits further exploration.

Differences in Responding to Reconnected and Scrambled Text: One conclusion from this study is that not all good readers pay attention to cohesive ties as important markers of relationships between ideas. Good readers who are poor writers did not use cohesion to help them comprehend material better, nor did they judge material which was cohesively linked to be better than scrambled material. It was here that their links to the other poor writers was stronger than their links to other good readers.

It is significant that the unscrambling task was the one task on which no differences were found between the two groups of good readers. This task did not require students to differentiate between scrambled and reconnected text. On both the recall and rating task at the sixth grade level, there were differences in how the two groups of good readers perceived the effect of reconnecting text. Reconnected text, as described earlier, was text in which the scrambled paragraphs were altered to clarify any unclear references

and to eliminate any illogical connectives. These changes were made to make text more cohesive, albeit still not globally coherent. If all three groups had judged the reconnected and scrambled paragraphs equally, one might claim that local coherence did not affect global understanding of the passages. However, good readers/good writers did appreciate the differences between the reconnected and the scrambled text at the sixth grade level.*

The lack of awareness among poor writers about how cohesion functions to aid comprehension may demonstrate a difference in how good readers/poor writers perceive their own writing when they revise. They may simply not see the need for making relationships clear through the use of language which ties ideas together. This does not mean that they never connect material through referring to it. It simply means that when reading material they may not think to themselves, "hey, if I only made this relationship clearer, others might understand it better."

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* Results for ninth grade paragraphs demonstrate that good readers/good writers found scrambled and reconnected paragraphs equal at the ninth grade level on both recall and rating tasks. This leveling off may have had to do with the greater conceptual difficulty in the ninth grade paragraphs (see discussion of passage difficulty, p. 75) and/or the differences in the amount of disruption caused each paragraph by the unscrambling and revision thereof (see discussion of content and organization, p. 72).

I would argue that ignoring the function of cohesive ties in making text clearer as seemed to happen in both the recall and rating tasks is not a sign of an inability to understand the workings of anaphoric reference. All groups did a good job of attributing information to the proper referent throughout material that was in the ordered text condition. The question, then, is more subtle and, I believe, tied into the lack of care that students who are poor organizers of writing may extend to their own use of reference and connection in writing.

This difference has possible roots in the manner in which different students learn the "rules" of talking at home. There is research evidence which stretches from Bernstein (1971) to Heath (1983) that working class families demand less specificity in language than middle class families. This difference is often expressed in the feeling that if participants in a conversation both understand the topic, then there is no need to refer specifically to it, to do so would be redundant.

Snow (1983) suggests that this ability to "decontextualize" language is separable from the acquisition of literacy skills. If this is true, then it is not at all surprising that there exists a large number of students who read well, but write poorly in schools such as those in

which I did my research which serve working class students.

The explicitness demanded in school writing (and, for that matter, talk -- see Michaels, 1981) may be unfamiliar to certain students. For instance, one of the paragraphs for my study discussed the water cycle, a familiar topic to most of my subjects. The scrambled version of the paragraph included the phrase, "the cold air up there". "There" was left unspecified. This lack of specification seemed to affect good readers/good writers differently from the other groups. These students rated the reconnected paragraphs in which "cold air up there" had been replaced by "cold air in the air's upper atmosphere" as a clearer paragraph than the scrambled paragraph, while the poor writer groups did not. Perhaps this is because the explicitness of the writing clarifies information to a good reader/good writer which to another student would be already clear because of accumulated background knowledge. Good writers saw the unspecified "there" as negatively affecting the overall coherence of a piece, while poor writers did not seem to view the clarified referent as important to the coherence of the scrambled paragraph.

Collins and Williamson (1984) were able to get high school students who scored poorly on reference and other aspects of inexplicitness to use more explicit language by

clarifying the necessity of explicitness in their instructions for an essay. However, in my study, the poor writers didn't make the distinctions between appropriate and inappropriate referential connections to help themselves gain meaning from text. My research, then, suggests that poor ninth grade writers may not perceive the advantage of clear cohesive ties.

If it is true that poor writers do not view clear cohesion as aiding them in understanding text, then one common method of teaching students to write more clearly -- asking students to take the position of a reader -- would not apply to teaching this aspect of organization. The issue in this case is not one of a writer distancing herself from her writing to gain perspective. When this reader reads, she does not use the cuing system herself. Therefore, the writer may not be inhibited by an egocentric point of view. The task of a teacher, then, would be to teach the part clear reference and conjunction play in making information more accessible to a reader.

Let me make it clear that this awareness will not often be needed by good readers when reading well structured text. Here, the links between ideas are generally clear. But the reading one does to revise material is more analytic and it involves understanding the elements of organization which

help to bring coherence to text; this study suggests that this understanding is less present among poor writers, even if they are good readers.

Differences between Paragraphs: a Relationship between Content and Organization: I stated in Chapter 3 that an attempt was made to find paragraphs for this study which would function equivalently when students were reading them. To do this, I chose paragraphs of the same text structure, readability level, overall macrostructure, number of sentences, and for the comprehension task, same number of words (within passage difficulty). Although the general direction of the study pointed to the paragraphs functioning similarly (i.e., all ordered paragraphs were recalled and rated better than scrambled and reconnected), still some scrambled paragraphs were recalled and rated better than reconnected, even by the good readers/good writers who showed an ability to distinguish between them. In addition, students met with varied success in their attempts to unscramble paragraphs.

In this study, then, several of the paragraphs which were used as equivalents acted differently from one another. This outcome led to an exploration of two issues: 1) the role that text organization and content play in helping or hindering students in performing tasks and 2) the

possibility that disruption of the organization of text at both the macro- and microstructure level can vary by paragraph, limiting the role that text structure plays in determining the overall organizational structure of paragraphs.

Reading researchers (e.g., Armbruster, Anderson, and Ostertag, 1987) have shown that learning a specific text structure can enhance one's understanding of information. From a writing perspective, McCutchen (1984) has shown that organization through "local coherence" (a term substantially similar to cohesion in Halliday and Hasan's (1976) definition) can act to ameliorate unfamiliarity with content as a factor in writing an essay.

To illustrate, the paragraph about jellyfish, a ninth grade difficulty paragraph employed in the rating and unscrambling task, was unscrambled by poor readers/poor writers with an ease not characteristic of other paragraphs in the study. In addition, this paragraph, in its ordered form, had a mean rating of 9.9 (out of a possible 10 points) among poor readers/poor writers, by far the highest rating given to any paragraph by any group.

In a retrospective reading of the paragraphs, my two assistants and I agreed that "Jellyfish" was the clearest cause and effect paragraph in the group of twelve paragraphs

read for this study; each sentence depended on its immediately preceding sentence to create an incremental set of effects. The results among poor readers suggest that clear organization can affect performance of a task to the extent that even those who would normally have difficulty with a task would be able to recognize and perform that task.

On the other hand, several paragraphs demonstrated that lack of familiarity with content can override organizational aspects of text. All three groups functioned equally poorly on the unscramblings and recalls of "Glaciers" and "Slaves in the Caribbean", and on unscramblings of "Agricultural Depression". I hypothesize that this is true in good part due to the unfamiliarity of the content and more specifically to the lack of understanding of chronological sequence in the two historical pieces and to the discussion of a very infrequently used term and concept (cirque) in the glacier paragraph.

In addition, though in this study I made the assumption that all paragraphs would function as equals based on their similar cause and effect structure, the reality was that certain paragraphs in their scrambled form were far less disrupted than others (see Appendix C, Tables 2-13 for examples).

As Meyer (1984) has pointed out, no text structure provides a template for writing all paragraphs. In natural text, then, the interrelationships between ideas are not driven by the structure, but the structure provides a convenient method to express the ideas. Variations are to be expected and those variations affected the scrambled and reconnected versions of the paragraphs. These variations, in turn, affected the performance of students on paragraphs within all tasks.

Content and organization, therefore, show a subtle interrelationship in which each can aid or deter from the other. Differences in organization within the cause and effect structure combined with differences in content knowledge to create the diverse responses found within paragraphs on each task. At the same time, two facts -- 1) that ordered text was consistently recalled and rated better than the two scrambled versions of text, and 2) that good readers recalled and rated sixth grade reconnected paragraphs as better than scrambled -- lead me to maintain that text organization does make a difference in the understanding of material, at least when it has the cause-effect structure.

Passage Difficulty: The effect of passage difficulty on performance was mixed in this study: students found sixth

grade passages more difficult to recall, both levels as having the same degree of organizational clarity, and ninth grade paragraphs more difficult to unscramble. This set of divergent results, some of which were contrary to hypothesized expectations, demands further clarification.*

I will first analyze the reason for lack of distinction between the two sets of paragraphs on the rating task, then proceed to discuss the recall and unscrambling results which seem to contradict one another.

The rating task asked students to focus on organization, not difficulty of content. Therefore, it is not surprising that the sixth and ninth grade passages were rated the same. However, organization is unlikely to have been completely divorced from content when students rated paragraphs for organizational clarity. This probably accounts for the trend toward ninth grade material being more difficult. The material may well have felt more difficult to understand overall and, therefore, it may not have made as much sense to students.

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* It should be remembered that different sets of paragraphs were used in the recall and rating tasks. Both sets were used in the unscrambling task.

Performance on the recall task, on the other hand, suggested that ninth grade paragraphs were recalled more

easily than sixth. A discussion of the effect of one anomalous sixth grade paragraph, glaciers, can be found in the results section. However, even if the results on this paragraph are discounted, the difference between recalls remains small. If one presumes that the ninth grade paragraphs were more difficult than the sixth, there must be evidence of other factors which inhibited students' performance on the sixth grade paragraphs or enhanced performance on ninth.

One plausible explanation has to do with sixth grade paragraphs always being read before ninth. This may have created a practice effect which inflated ninth grade scores in relation to sixth. In particular, many students had difficulty on their first recall due to nervousness and lack of familiarity with the task. This translated into a mean score of 2.0 on recalls for first paragraphs across text conditions as opposed to 2.3 for sixth grade paragraphs which were recalled second or third. This "first paragraph" effect, when combined with the difficulty of "glaciers" deflated the mean score of sixth grade paragraphs making them appear more difficult to recall than ninth.

There is further evidence which leads me to believe that the ninth grade paragraphs used in the recall task were of a difficulty equal to or greater than the sixth.

Students had greater difficulty unscrambling these ninth grade paragraphs than the sixth (with the exception of "Glaciers").

Summary: Overall, the picture that is painted from this study suggests that good readers/good writers are quite adept at all three tasks: recall, rating and unscrambling. They distinguish between the three text conditions, though less so on ninth grade paragraphs. They seem to understand the importance of both global coherence and local sentence-to-sentence cohesion to text organization. They also seem to approach material strategically, adjusting their reading (and revising in the unscrambling task) to the task.

Like good readers/good writers, good readers/poor writers are able to distinguish between well and poorly organized text; they rate ordered paragraphs as better than both reconnected and scrambled. Their performance on the unscramblings suggests an ability to manipulate poorly organized material to make it clearer that they do not demonstrate when they revise their own work. However, their performance in recalling and rating reconnected text suggests a lack of awareness of how cohesive ties can help bring meaning to disorganized text. In addition, it seems that good readers/poor writers may have had difficulty organizing their recalls of some paragraphs. In sum, good

readers/poor writers were skilled at tasks which drew on their knowledge of overall organization. However, they may need greater focus on cohesive relationships and, not surprisingly, on organizing their own responses to material.

Poor readers/poor writers, as might be expected, have an even harder time distinguishing between well and poorly organized material. They have difficulty recalling material whether it is organized or not. They make less distinction between well and poorly organized material. They have greater difficulty unscrambling poorly organized paragraphs. They do, when rating paragraphs for organizational clarity, make the distinction between well and poorly organized material and, therefore, seem to understand differences between material which "makes sense" and that which does not. However, unlike either set of good readers, they do not seem able to use this information to their advantage when grappling with the material to summarize or unscramble it. In addition, they actually judge material which is scrambled to be better organized than that which is reconnected, suggesting that their understanding of the importance of referential and logical connection to the organization of a piece is not well developed.

Reconnecting scrambled text does not seem to make it easier to understand for any group with the exception of

good readers/good writers when the text is easy for them to understand. However, good readers/good writers do distinguish between reconnected and scrambled text when they rate the organizational clarity of a paragraph. These results seem to provide further evidence that cohesion may make a piece more readable, at least for good readers who use organization well when they write. However, they also tend to confirm that overall coherence is more important to a piece of writing's comprehensibility than sentence to sentence clarity.

Chapter 6. Implications

In this thesis, I have examined an aspect of writing which is too often ignored in the teaching of writing -- organization. I have shown that in my study all students when they read showed an understanding of the difference between well and grossly out of order text. In addition, those who are good readers demonstrated an ability to manipulate text to make it more organized. These results provide the basis for discussing methods to teach students to gain awareness of organization as they revise their work through tapping what they already know about text organization when they read. For the most part that is what this implications section will address.

At the same time, I am interested in the implications suggested by good readers/poor writers in their poor recalling of text, and in the meaning of the difficulties experienced by all poor writers when confronting reconnected text. Further exploration of these issues will lead to a deeper understanding of organization and its place in reading and writing.

Teaching Organizational Skills: Hillocks (1986) advocates an analytic approach to teaching revision in his meta-analysis of writing research. He suggests the direct

teaching of skills needed to write clearly. Hillocks found that instruction in traits such as organization (see, for instance, Clifford, 1981, Sager, 1973) before asking students to revise increased their writing proficiency. Simply giving students the opportunity to prewrite and revise does not, in his opinion, always produce better written work. If students are not being taught the tools to discuss organization, it may be useful to teach them these skills.

This study suggests that some good readers, in particular, are not exercising "executive control" (Perfetti and McCutchen, 1987) over their organizational understandings as they revise; however, they have the potential to do so. This is reinforced by the fact that in their strategy interviews, students spoke often of organizing material in a topic-centered manner. Therefore, good readers who are poor writers need to be presented with situations in which they can begin to exercise their understandings in a more explicit manner, taking information from the cognitive plane and placing it on an explicit, metacognitive level. Poor readers might also benefit from this practice as they, too, understand when writing is less comprehensible because it lacks organization. And, as Palincsar (1984) suggests, they need to begin analyzing the

reasons for material lacking sense.

I believe that students able to distinguish between writing which makes sense and that which doesn't might be able to transfer their understandings when reading others' writing to the revising of their own written work. Being able to gain skill through analyzing text which has little emotional attachment may well be a better way to deal with difficulties in writing than describing difficulties in a piece of writing which is a student's own. In this way, insights about and through reading can be brought to bear on writing. For writing encompasses a reading element at the moment one rereads and reflects on one's own words and their potential effect on a reader.

I believe that the activities used as tasks in this study might be used in a classroom to initiate discussions of what constitutes well and poorly organized writing. Scrambling paragraphs from textbooks, evaluating their problems, reordering them, discussing why that order is better or worse -- in short, analyzing the different aspects of text organization using models -- could provide a needed focus on organization which could, in turn, help students examine their own text with a critical eye.

Approaching the skill of organization from the reading of others' well and poorly organized text would be a useful

method to help students arrive at Murray's (1986) "other self" necessary when revising their own work. In this way, then reading and writing can be connected and the reading that is necessary for thoughtful written production can be taught without directly focusing on the writer's weakness.

In summary, my research suggests that both good and poor ninth grade readers can distinguish between well and poorly organized material. This ability provides teachers with the opportunity to begin discussions about what makes writing well and poorly organized. This, in turn, provides students with a chance to build an analytical framework and a vocabulary of organizational factors with which to respond to their own and others' work. This methodology recognizes the strengths brought to the writing experience by both good readers/poor writers and poor readers/poor writers. It builds on the moments when students say, "this doesn't make sense" and gives clearer meaning to those words. A follow-up study might well examine this approach in a ninth grade classroom.

Gaining an Understanding of How Good Readers May Differ in Skills: This research also suggests that there are differences between good readers. It would certainly be interesting to reflect more on what makes a good reader. One area in which good readers/poor writers differed on the

basis of their writing skill was in their ability at the ninth grade level to summarize even well organized paragraphs. I noted in the discussion that this difference may be due to good readers/poor writers' inability to organize recalls of more difficult material; they may remember content, but recount it in a poorly organized form.

If this is the case, and this speculation needs further exploration, then it opens up questions about an area in which not all good readers are alike. Is being less able to recall/recount material a sign of a poorer reader, or is it instead the sign of a poorer thinker, organizer, and/or writer?

Certainly, the reader who does not respond well on papers or essay questions to their readings will have more difficulty as an English student. In my own experience as a Chapter I coordinator, I have seen many students recommended for Chapter I English classes based on their writing, rather than tested reading skill. If it is organizational skills which most separate out students who are otherwise good readers, then the ability to help them focus on their organization in writing by using their strengths as readers (i.e.; the ability to distinguish well from poorly organized text) should make it easier for them to become more successful students.

At the same time, these results raise the question of how to measure organization's contribution to meaning in reading. They suggest a discrepancy between performance on multiple choice reading comprehension tests and performance on recalls of passages. There has been a movement towards establishing more open-ended questions in reading comprehension tests. The NAEP (Applebee, Langer, & Mullis, 1988) has suggested greater difficulty in expression of ideas than in completion multiple choice items. Could part of this be due to difficulty with organizing responses? Would good readers be separated, in this case, on the basis of differences in writing skill?

Teaching Attention to the Importance of Clear Cohesion: There is one aspect of text organization in which all poor writers share difficulty, and this is in using cohesive ties to gain greater control of poorly organized text. It is possible that, though poor writers can identify referential relationships in well organized text, their understanding of that text does not constitute complete control of referential relationships. If this is the case, simply using models and discussing difficulties in text might not adequately respond to the lack of awareness shown by all poor writers.

I have already argued in Chapter 5 that the two poor

reader groups lack an awareness of the function of clear reference in giving important information to a reader. I believe, therefore, that the issue of understanding clear reference goes beyond simply gaining a less egocentric view of the writing process. I have also argued that all my students generally had no trouble making connections between referents in well-ordered paragraphs. This fact suggests that methods of teaching "cohesion comprehension" (e.g., Irwin, 1986) which focus on, for instance, pronouns being made to co-refer to an appropriate co-referent would not remedy the difficulties my poor writers had in understanding the importance of clear reference to gaining meaning in text.

At the same time, my results point to the probability that simply treating the problem as one of lack of familiarity with conventions would probably be remiss. While the eleventh grade students described by Collins and Williamson (1984) were able to make reference more explicit when asked to rewrite an essay for an unfamiliar audience, my students didn't find specific reference to be helpful to comprehending poorly organized material. There is only a small chance that the poor writers I tested would adequately read their papers to revise unclear reference on the basis of a teacher's suggestion to make material clearer

to an unfamiliar audience.

I believe this data first points to the inadequacy of a cognitive interpretation of difficulty with cohesive ties being tied to an inability to take a reader's perspective. Instead, it seems that poor writers in this study do not yet have an adequate understanding of the place clear reference plays in making material clearer. Without this understanding it is difficult to exercise executive control over the process. It is very probable that lack of familiarity with conventions feeds this lack of understanding, but so probably too does the lack of control over this aspect of the language -- not the ability to use co-reference, but the recognition of the importance of specificity in providing a clear connection between information in text.

How does this translate into practice? My feeling is that the methodology of reading teacher-created poorly organized text for its inconsistencies before being asked to examine them in one's own writing remains a useful methodology. I believe students need to be confronted with text that doesn't make sense -- in this case, text in which "they"s or "it"s or other unspecific pronouns are read in text in which these pronouns have no co-referent. These gross violations of the convention that writers should give

adequate information to a reader for them to understand what a writer is talking about should be an excellent starting place for a discussion of the importance of clear reference. The methodology which uses reading to approach organizational problems can provide a model for the way students might approach their own work.

At the same time, teachers should be made aware of the fact that many students are not brought up to expect the same kind of explicit language demanded in school. Teachers need to respect differences in home and school language while building bridges to the specific writing we value in school.

Conclusion: This study has demonstrated that not all poor writers are alike in their understanding of organization in text. Poor writers who are also good readers have a strong sense of global aspects of organization such as main idea and the need for information about a particular subject being placed together. This understanding suggests an opportunity for teachers to build on the strengths of these poor writers by drawing on their ability to analyze and manipulate text that they read. The task is to teach them to transfer the knowledge they already have to their revising of their own work. Reading and responding to poorly organized material might provide the

necessary link.

Furthermore, though students who were poor readers and writers were not adept at manipulating text, they demonstrated a capability to differentiate between well and poorly organized text. Therefore, I believe that the activities recommended for good readers/poor writers might well also function to solidify all poor writers' understanding of the importance of well organized text to their own writing.

At the same time, this data clearly suggests a need to teach poor readers to interact with text in a manner which suggests they have a role in interpreting text. Far too often poor readers see information not making sense, but they do not adequately respond with strategies to ameliorate this situation. Poor readers need to gain a sense of executive control in this situation.

In conclusion, I am impressed by what students do know about text organization when they read. Now it is our responsibility as teachers and researchers to help them gain greater control of this knowledge so that they can produce clearer, better organized written work.

Chapter 7: Dissemination of This Study

One of the purposes of the grant which I was awarded was to work closely with teachers and other school personnel so that my research might have an impact upon practice within my district and beyond. I have described in my foreword the strong support I received from numerous District personnel in the conduct of my study. In this chapter, I will describe ways in which I have begun and will continue to disseminate the results of my study.

Dissemination in My School District: After completion of data-gathering, I sent out an invitation to approximately twenty five teachers and administrators in my district to join me in preliminary analysis of this data. In-service and/or college credit was offered for this set of six workshops. I received a great response, though not all invitees were able to participate. Eight district employees did participate in one or more of the six sessions. These included a first grade teacher, the District's elementary curriculum specialist in language arts, the evaluation and research department's expert on reading and writing evaluation, a middle school curriculum vice principal who also teaches the District's Writing Project for teachers, and four high school English teachers. This group analyzed

preliminary data and debated what the data meant for their classrooms.

Of particular interest was a debate about whether analytical methods such as those I propose to help students focus on organization would work. Some teachers felt that students demonstrated better organizational skills on material in which they had greater interest. "I search" papers were used as a specific example of papers where students seemed to improve their organization without specific help. Could it be that students learning about information new to them would assume that teachers might not know this information either? If this were so, students might feel a need for greater clarity in their writing; they might not expect teachers to be able to fill in the necessary context and, therefore would focus on organizational aspects of text (in particular, clear reference) to better communicate ideas. This intuition on the part of teachers may be backed up by Collins and Williamson's research mentioned in my implications section. I found the discussions enlightening and I believe participants did as well especially as we focused on aspects of organization.

I have also participated in a "Teacher as Researcher" in-service offered by the District's language arts

curriculum specialists. This workshop offered me a chance to continue discussion of my project and its implications with 15 district teachers who spanned all grade levels. At the same time, I learned from each of their interests in classroom issues and research methodologies.

Recently, I contacted English Departments in all the schools in which I gathered data. I have offered to share my findings with each of the departments and will ask for their feedback on how my findings might impact their teaching. I also hope to speak with groups of interested participants in my study to give and get feedback about the study.

I hope to collaborate with several teachers in the District in implementing and documenting some of the ideas proposed in the implications section of this paper. In this manner, what I have learned from this project will blossom into a more concrete concept of teaching ninth graders to pay more attention to organizational aspects of writing.

Dissemination of the Study outside My District: In April, 1989, I presented a paper on my methodology and preliminary findings to the Oregon Educational Research Association's Annual State Conference whose theme was "Action Research." The paper detailed both the logistical aspects of making the study work and a description of the study itself. The reaction to the paper was very positive.

The Washington Organization of Reading Development (WORD) 1991 Reading Research Conference has accepted my proposal to detail my study, its results, and implications as has the Northwest Regional Conference of the National Council of Teachers of English 1991 conference. I have also prepared a proposal for the same organization's national conference and will prepare a proposal to the International Reading Association's 1992 National Conference.

Finally, I will soon begin editing this report to submit to Reading Research Quarterly with the hope of getting it published. Research is most useful when it can be used to reflect on, and sometimes change, practice. Feedback from practitioners also provides researchers with a real world interpretation of their work. As a teacher and a researcher, I look forward to continued dialogue about a project I very much enjoyed doing.

Ordered Version

Earthworms help to keep the soil in proper condition. As they crawl about underground, they loosen the soil. As they search for food, some of the earth enters their mouths and passes straight through their bodies. In this way, the soil is ground up and kept from getting hard. At the same time, air and water enter the ground through the tiny holes made by earthworms. The loose leaves and seeds that the earthworms pull into the ground decay. This decaying material enriches the soil.

Scrambled Version

As they search for food, some of the earth enters their mouths and passes straight through their bodies. At the same time, air and water enter the ground through the tiny holes made by earthworms. Earthworms help to keep the soil in proper condition. In this way, the soil is ground up and kept from getting hard. This decaying material enriches the soil. The loose leaves and seeds that the earthworms pull into the ground decay. As they crawl about underground, they loosen the soil.

Reconnected Version

As earthworms search for food, some ( ) earth enters their mouths and passes straight through their bodies. ( ) Air and water enter the ground through the tiny holes made by these earthworms. The earthworms help to keep the soil in proper condition. ( ) The soil is ground up and kept from getting hard. ( ) Decaying material enriches the soil. ( ) Loose leaves and seeds that the earthworms pull into the ground decay. As the earthworms crawl about underground, they loosen the soil.

Appendix B. Raintown Direct Writing Assessment Analytical Rating Guide for Organization

5 The writer organizes material in a way that enhances the reader's understanding, or that helps to develop a central idea or theme. The order may be conventional or not, but the sequence is effective and moves the reader through the paper.

- o Details seem to fit where they're placed, and the reader is not left with the sense that "something is missing."
- o The writer provides a clear sense of beginning and ending, with an inviting introduction and a satisfying conclusion ("satisfying" in the sense that the reader feels the paper has ended at the right spot).
- o Transitions work well; the writing shows unity and cohesion, both within paragraphs and as a whole.
- o Organization flows so smoothly that the reader doesn't have to think about it.

3 The writer attempts to organize ideas and details cohesively, but the resulting pattern may be somewhat unclear, ineffective, or awkward. Although the reader can generally follow what's being said, the organizational structure may seem at times to be forced, obvious, incomplete or ineffective.

- o The writer seems to have a sense of beginning and ending, but the introduction and/or conclusion tend to be less effective than desired.
- o The order may not be graceful fit with the topic (e.g., a forced conventional pattern, or lack of structure).
- o The writer may miss some opportunities for transitions, requiring the reader to make assumptions or inferences.
- o Placement or relevance of some details may be questionable (e.g., interruptive information; writer gets to the point in roundabout fashion).
- o While some portions of the paper may seem unified (e.g., organization within a given paragraph may be acceptable), cohesion of the whole may be weak.

1 Organization is haphazard and disjointed. The writing shows little or no sense of progression or direction. Examples, details, or events seem unrelated to any central idea, or may be strung together helter-skelter with no apparent pattern.

- o There is no clear sense of a beginning or ending.
- o Transitions are very weak or absent altogether.
- o Arrangement of details is confusing or illogical.
- o There are noticeable information "gaps;" the reader is left dangling, or cannot readily see how the writer got from one point to another.
- o The paper lacks unity and solidarity.

Appendix C

Table 1. Paragraphs In Study

Paragraphs used in Comprehension Task:

6th grade	# of sentences	# of words	# of words (reconnected text condition)
Earthworms	7	85	82
Glaciers	7	85	84
Acid rain	7	85	97
9th grade			
Algae	7	79	76
Plains Indians	7	79	93
Slaves in Carribbean	7	79	81

Paragraphs Used In Organizational Rating Task:

6th grade	# of sentences	# of words	# of words (reconnected text condition)
Sahara Desert	6	79	76
Water Cycle	6	65	64
Sediment	6	73	83
9th grade			
Agricultural Depression	6	81	78
Monsoons	6	83	81
Jellyfish	6	62	65

note: all 12 paragraphs used in unscrambling task

Table 2. Sixth Grade Recall Paragraph # 1: Earthworms

Ordered Condition

Earthworms help to keep the soil in proper condition. As they crawl about underground, they loosen the soil. As they search for food, some of the earth enters their mouths and passes straight through their bodies. In this way, the soil is ground up and kept from getting hard. At the same time, air and water enter the ground through the tiny holes made by earthworms. The loose leaves and seeds that the earthworms pull into the ground decay. This decaying material enriches the soil.

Scrambled Condition

As they search for food, some of the earth enters their mouths and passes straight through their bodies. At the same time, air and water enter the ground through the tiny holes made by earthworms. Earthworms help to keep the soil in proper condition. In this way, the soil is ground up and kept from getting hard. This decaying material enriches the soil. The loose leaves and seeds that the earthworms pull into the ground decay. As they crawl about underground, they loosen the soil.

Reconnected Condition

As earthworms search for food, some () earth enters their mouths and passes straight through their bodies. At the same time, air and water enter the ground through tiny holes made by these earthworms. Earthworms help to keep the soil in proper condition. () The soil is ground up and kept from getting hard. () Decaying material left by earthworms enriches the soil. The loose leaves and seeds that the earthworms pull into the ground decay. As earthworms crawl about underground, they loosen the soil.

Excerpted from New Practice Readers E, 1978

Table 3. Sixth Grade Recall Paragraph # 2. Glaciers

Ordered Condition

Glaciers that form in mountains change the shape of the mountains. The changes begin at the top of the valley where snow and ice collect. Frost entering the cracks in rock breaks the rock from the valley walls. Rock is picked up from the valley floor as the glacier moves. The upper end of the valley is changed into a rounded steep-walled basin called a cirque. Many cirques can form close together in mountains. They cause the ridges to become very sharp and jagged.

Scrambled Condition

Frost entering the cracks in rock breaks the rock from the valley walls. The upper end of the valley is changed into a rounded steep-walled basin called a cirque. Glaciers that form in mountains change the shape of the mountains. Rock is picked up from the valley floor as the glacier moves. They cause the ridges to become very sharp and jagged. Many cirques can form close together in mountains. The changes begin at the top of the valley where snow and ice collect.

Reconnected Condition

Frost entering () cracks in rock breaks the rock from valley walls. The upper end of the valley is changed into a rounded steep-walled basin called a cirque. Glaciers that form in mountains change the shape of the mountains. Rock is picked up from the valley floor as the glacier moves. Cirques forming close together cause mountain ridges to become very sharp and jagged. Many cirques can form close together in mountains. Changes begin at the top of a valley where snow and ice collect.

Excerpted from Holt Earth Science, 1986

Table 4. Sixth Grade Recall Paragraph # 3. Acid Rain

Ordered Condition

In parts of the United States and Canada, people worry about the pollution caused by acid rain. This kind of rain falls on the land and into lakes and streams. When it reaches lakes and streams, it adds to the amount of acid in the water. This change kills fish and other living things. At the same time, acid rain breaks down minerals in the soil. This breakdown robs plants of important materials for growth. So some plants cannot live where there is acid rain.

Scrambled Condition

When it reaches lakes and streams, it adds to the amount of acid in the water. At the same time, acid rain breaks down minerals in the soil. In parts of the United States and Canada, people worry about the pollution caused by acid rain. This change kills fish and other living things. So some plants cannot live where there is acid rain. This breakdown robs plants of important materials for growth. This kind of rain falls on the land and into lakes and streams.

Reconnected Condition

When acid rain reaches lakes and streams, it adds to the amount of acid in the water. At the same time, acid rain breaks down minerals in the soil. In parts of the United States and Canada, people worry about the pollution caused by this acid rain. A change caused by increased amounts of acid in water kills fish and other living things. () Some plants cannot live where there is acid rain. The breakdown robs plants of important materials for growth. Acid rain falls on the land and into lakes and streams.

Excerpted from Silver Burdett Science 5, 1985

Table 5. Ninth Grade Recall Paragraph # 1. Algae

Ordered Condition

Algae play an important role in the environments in which they live. In the oceans and lakes, they are the basic food source for most organisms. Algae are eaten by protozoans and other small organisms. These, in turn, are food for the larger fish. Some whales, the largest ocean organisms, feed directly on algae, the smallest. Where algae are abundant, so are other forms of life. Parts of the oceans are barren of life because algae cannot grow there.

Scrambled Condition

Algae are eaten by protozoans and other small organisms. Some whales, the largest ocean organisms, feed directly on algae, the smallest. Algae play an important role in the environments in which they live. These, in turn, are food for the larger fish. Parts of the oceans are barren of life because algae cannot grow there. Where algae are abundant, so are other forms of life. In the oceans and lakes, they are the basic food source for most organisms.

Reconnected Condition

Algae are eaten by protozoans and other small organisms. Some whales, the largest ocean organisms, feed directly on algae, the smallest. Algae play an important role in the environments in which they live. Protozoans () are food for the larger fish. Parts of the oceans are barren of life because algae cannot grow there. Where algae are abundant, so are other forms of life. In the oceans and lakes, algae are the basic food source for most organisms.

Excerpted from Holt Life Science, 1986

Table 6. Ninth Grade Recall Paragraph # 2. Plains Indians

Ordered Condition

Plains Indians placed on reservations after 1876 were forced to depend on the U.S. government. They were not allowed to hunt or to make war, both of which were important to them. Their food and clothing came from the agent on the reservation. All rules were made by the agent or other white officials. This was bad enough. But agents were often corrupt or simply not concerned about the Indians. Tribes usually lacked proper food, shelter, medical care, and education.

Scrambled Condition

Their food and clothing came from the agent on the reservation. This was bad enough. Plains Indians placed on reservations after 1876 were forced to depend on the U.S. government. All rules were made by the agent or other white officials. Tribes usually lacked proper food, shelter, medical care, and education. But agents were often corrupt or simply not concerned about the Indians. They were not allowed to hunt or to make war, both of which were important to them.

Reconnected Condition

Plains Indians' food and clothing came from the agent on the reservation. The fact that the Indians were not allowed to live as they had was bad enough. These Indians placed on reservations after 1876 were forced to depend on the U.S. government. All rules were made by the agent or other white officials. Tribes usually lacked proper food, shelter, medical care, and education. ()The agents were often corrupt or simply not concerned about the Indians. The Plains Indians were not allowed to hunt or to make war, both of which were important to them.

Excerpted from American History, Allyn & Bacon, 1986

Table 7. Ninth Grade Recall Paragraph # 3. Slaves in the Caribbean

Ordered Condition

Black people make up the majority in every Caribbean country except Cuba and Puerto Rico. During the colonial period, the Spanish used Indians as slaves. After about one hundred years, though, most Indians had died of disease or overwork. The landowners then began to bring over Africans as slaves. The proportion of blacks in the population increased. Eventually, the proportion of Europeans became small. By the time most of the Caribbean countries became independent, their populations were mainly black.

Scrambled Condition

After about one hundred years, though, most Indians had died of disease or overwork. The proportion of blacks in the population increased. Black people make up the majority in every Caribbean country except Cuba and Puerto Rico. The landowners, then, began to bring over Africans as slaves. By the time most of the Caribbean countries became independent, their populations were mainly black. Eventually, the proportion of Europeans became small. During the colonial period, the Spanish used Indians as slaves.

Reconnected Condition

After about one hundred years of Spanish rule, () most Indians in the Caribbean had died of disease or overwork. The proportion of blacks in the population increased. Black people make up the majority in every Caribbean country except Cuba and Puerto Rico. ()Landowners () began to bring over Africans as slaves. By the time most of the Caribbean countries became independent, their populations were mainly black. () The proportion of Europeans became small. During the colonial period, the Spanish used Indians as slaves.

Excerpted from Follet Social Science: Latin America and Canada, 1983

Table 8: Sixth Grade Rating Paragraph # 1. Sahara Desert

Ordered Condition

An American research team has proposed a theory about why the Sahara became a desert. They believe that goats, herded for hundreds of years by every group of desert dwellers, ate all the plants. This left the land exposed to soil erosion. The wearing away of the soil made it impossible for trees to grow. Without trees, there was no shade to stop the sun from evaporating the surface water. The earth dried up, and the plant-life died.

Scrambled Condition

The wearing away of the soil made it impossible for trees to grow. They believe that goats, herded for hundreds of years by every group of desert dwellers, ate all the plants. Without trees, there was no shade to stop the sun from evaporating the surface water. The earth dried up, and the plant life died. An American research team has proposed a theory about why the Sahara became a desert. This left the land exposed to soil erosion.

Reconnected Condition

A wearing away of soil in the Sahara Desert made it impossible for trees to grow. An American research team believes that goats, herded for hundreds of years by every group of desert dwellers, ate up all the plants. Without trees, there was no shade to stop the sun from evaporating ()surface water. The earth dried up and () plant life died. The American research team has proposed a theory about why the Sahara became a desert. The eating of the plants by goats left the land exposed to soil erosion.

Excerpted from Reading Skills Builder 6, 1985

Table 9. Sixth Grade Rating Paragraph # 2. Water Cycle

Ordered Condition

The water cycle acts as a huge air-conditioning system for the earth. The sun warms up the oceans, lakes, and rivers. The sun's heat causes the water to evaporate. The water vapor rises into the earth's upper atmosphere. The cold air up there causes the vapor to turn back into water. This water falls back to the earth in the form of rain or snow.

Scrambled Condition

The water vapor rises into the earth's upper atmosphere. The sun warms up the oceans, lakes, and rivers. The cold air up there causes the vapor to turn back into water. This water falls back to the earth in the form of rain or snow. The water cycle acts as a huge air-conditioning system for the earth. The sun's heat causes the water to evaporate.

Reconnected Condition

() Water vapor rises into the earth's upper atmosphere. The sun warms up oceans, lakes, and rivers. () Cold air in the earth's upper atmosphere causes vapor to turn back into water. This water falls back to the earth in the form of rain or snow. The water cycle acts as a huge air-conditioning system for the earth. The sun's heat causes () water to evaporate.

Excerpted from Horizons, Recognizing Cause and Effect, E, 1980

Table 10. Sixth Grade Rating Paragraph # 3. Sediment

Ordered Condition

How can sediment accumulate in great deposits in oceans, rivers, streams, and lakes? When a river flows into an ocean or a lake, it slows down in speed and drops the particles it is carrying. This process is called settling. The particles are deposited in layers on the ocean or lake floor. The largest and heaviest rock pieces are usually the first to settle. Then lighter and lighter pieces settle in layers above.

Scrambled Condition

The particles are deposited in layers on the ocean or lake floor. When a river flows into an ocean or a lake, it slows down in speed and drops the particles it is carrying. The largest and heaviest rock pieces are usually the first to settle. Then lighter and lighter pieces settle in layers above. How can sediment accumulate in great deposits in oceans, rivers, streams and lakes? This process is called settling.

Reconnected Condition

() Particles of sediment are deposited in layers on an ocean or lake floor. When a river flows into an ocean or a lake, it slows down in speed and drops the particles it is carrying. The largest and heaviest rock pieces are usually the first to settle. Then lighter and lighter pieces settle in layers above. How can sediment accumulate in great deposits in oceans, rivers, streams and lakes? The process of particles dropping to the ocean or river floor is called settling.

Excerpted from Principles of Science, 1986

Table 11. Ninth Grade Rating Paragraph # 1. Agricultural Depression

Ordered Condition

In the 1920's, one of the major economic weaknesses was in agriculture. After World War I, the high wartime demand for wheat fell. At the same time, the use of more advanced equipment and techniques led to a huge expansion of wheat production. As a result of the larger supply and lower demands, the world price of wheat dropped sharply. By 1930, a bushel of wheat cost less than it had in 400 years. Wheat growers all over the world were facing ruin.

Scrambled Condition

As a result of the larger supply and lower demand, the world price of wheat dropped sharply. After World War I, the high wartime demand for wheat fell. By 1930, a bushel of wheat cost less than it had in 400 years. Wheat growers all over the world were facing ruin. In the 1920's one of the major economic weaknesses was in agriculture. At the same time, the use of more advanced equipment and techniques led to a huge expansion of wheat production.

Reconnected Condition

As a result of () larger supply and lower demand, the world price of wheat dropped sharply. After World War I, the high wartime demand for wheat fell. By 1930, a bushel of wheat cost less than it had in 400 years. Wheat growers all over the world were facing ruin. In the 1920's, one of the major economic weaknesses was in agriculture. () The use of more advanced equipment and techniques led to a huge expansion of wheat production.

Excerpted from History and Life : The World and Its People, 1984

Table 12. Ninth Grade Rating Paragraph # 2. Monsoons

Ordered Condition

Life in India has been dependent upon its seasonal winds, called monsoons. The summer monsoons that blow from the Arabian sea and the Indian Ocean carry much moisture. If these monsoons fail, crops do not grow well and famine results. Lack of water has caused terrible crop failures and famines throughout Indian history, bringing much suffering and death. Thus, great efforts have been made to guard water supplies. Thousands of pond have been dug to hold rainfall for use during the dry season.

Scrambled Condition

Lack of water has caused terrible crop failures and famines throughout Indian history, bringing much suffering and death. The summer monsoons that blow from the Arabian Sea and the Indian Ocean carry much moisture. Thus, great efforts have been made to guard water supplies. Thousands of ponds have been dug to hold rainfall for use during the dry season. Life in India been dependent upon its seasonal winds, called monsoons. If these monsoons fail, crops do not grow well and famine results.

Reconnected Condition

Lack of water has caused terrible crop failures and famines throughout Indian history, bringing much suffering and death. () Summer monsoons that blow from the Arabian Sea and the Indian Ocean carry much moisture. () Great efforts have been made to guard water supplies. Thousands of ponds have been dug to hold rainfall for use during the dry season. Life in India has been dependent upon its seasonal winds, called monsoons. If these monsoons fail, crops do not grow well and famine results.

Excerpted from History and Life : The World and Its People, 1984

Table 13. Ninth Grade Rating Paragraph # 3. Jellyfish

Ordered Condition

How does a jellyfish catch its food? It grasps a nearby animal with its tentacles. Coiled threads shoot out from the tentacles and stick into the animal. Poison from the threads is injected into the animal paralyzing it. The tentacles then pull the paralyzed creature into the jellyfish's central body cavity. Here the animal is digested and absorbed by the body cells.

Scrambled Condition

Poison from the threads is injected into the animal paralyzing it. It grasps a nearby animal with its tentacles. The tentacles then pull the paralyzed creature into the jellyfish's central body cavity. Here the animal is digested and absorbed by the body cells. How does a jellyfish catch its food? Coiled threads shoot out from the tentacles and stick into the animal.

Reconnected Condition

Poison from () threads in a jellyfish's tentacles is injected into an animal paralyzing it. A jellyfish grasps a nearby animal with its tentacles. The tentacles () pull the paralyzed creature into the jellyfish's central body cavity. Here the animal is digested and absorbed by the body cells. How does a jellyfish catch its food? Coiled threads shoot out from the tentacles and stick into the animal.

Excerpted from Principles of Science, 1986

Appendix D. Instructions for Participants in Study

In the next hour, you will be helping me understand how important organization is to understanding what you read. You will be doing three different tasks, some of which will be quite challenging, if not difficult. Please be patient with yourself and the tasks. This is a test not of you, but of these passages' ability to communicate with you. After you've finished, I will be talking with you about the strategies you used to help you do the tasks.

Task 1: In this first task you will be reading, then recalling 6 paragraphs. Some will seem clear; others will seem less clear. Read each paragraph until you've understood it as well as possible, then hit the space bar immediately and the screen will go blank. Begin talking into the tape recorder about all the information you remember from the paragraph. When finished, hit the space bar again and proceed to the next paragraph.

This first task is the most difficult. I would expect you to have difficulty on at least some of the paragraphs. Just take your time and let yourself remember as much as you can.

Task 2: On this task, you will be rating six paragraphs for how well organized they seem. What I mean by organization is arranging things in a way that makes them clearer. When reading these paragraphs you might ask yourself to what extent ideas are arranged in an order that helps make the information clearer for a reader.

Please rate each passage on a scale from 1 (very poorly organized) to 10 (very well organized).

When you have decided your rating, type the number on the keyboard, then hit "return" to proceed to the next paragraph. Before beginning the paragraphs, you will practice by rating 3 sentences for their organization.

Task 3: On this last task, you will be placing mixed up sentences in an order that makes sense to you. You will do this for four paragraphs.

When reordering sentences, you can move one sentence at a time. The instructions will read, "move sentence _ in front of sentence _ ." Type the number of each sentence and the sentences will automatically change position on the screen.

Move sentences as many times as you wish until you are satisfied that the paragraph is organized in the best way for understanding the information. Then press 0 and you will proceed to the next paragraph.

Now, you will have a chance to practice this process on one, short sample paragraph.

Appendix E: Strategy Interview Questions

1. In the first task in which you were asked to read, then recall as much information as you could, how did you decide what information to remember? Did you do something different when you thought the information was confusing? What?

2. On the second task in which you had to read and then rate paragraphs for their organization, what told you whether something was well or poorly organized? Were there any words which helped you figure this out? Did you rate any paragraphs in between very poor and very well organized? (if, yes) What caused you to rate them better than a paragraph you rated as very poorly organized?

3. In the last task in which you rearranged mixed up sentences until they were as well organized as possible, are you confident that you placed the sentences in the best possible order to understand them? (If not) Are you confident on some of them? Which ones? What strategies did you use to decide which sentences to move?

4. As you think back over all 12 paragraphs that you read for all the different tasks, were there any that interested you more than others? Do you think you did better on the ones which interested you most? Did your interest come before reading or were you more interested because you felt more confident that you'd done the task well after reading them and doing the task? Were there any paragraphs where you had studied the information before/ knew about the information ahead of time? Do you think this helped you do well on the task?

Appendix F. Rubrics for Scoring Student Responses

Rubric for Scoring Recall Protocols

note: range 1 (poor recall) - 4 (excellent recall)

4:

a. main idea clearly stated in beginning or end position
b. maintains cause/effect relationships
c. includes most details
d. maintains sequential organization
e. no erroneous information present

3:

a. states or clearly implies main idea, though not necessarily in beginning or end position
b. some cause/effect relationships discernable, though not necessarily explicit
c. many details present
d. organization not entirely sequential; details can seem list-like
e. little or no erroneous information present

2:

a. main idea unelaborated or directly quoted from text or may be unstated
b. connection between main idea and details, cause/effect, and/or sequence not clear
c. few details
d. some erroneous information possible

1:

No clarity about the process which paragraph discusses (i.e.; topic stated, but little or no detail and/or several details present without connection between ideas being clarified and/or topic and information erroneous).

Table 2: Coherence Rubric Used to Score Unscrambled Paragraphs

4 (highly coherent):
- A. The main idea is clear.
- B. All supporting information clearly relates to main idea and to antecedent and subsequent supporting information.
- C. The sequence of ideas is logical.
- D. The content is accurate.
- E. The paragraph achieves a sense of closure.
- F. Referential ties are clear throughout paragraph.

3 (mostly coherent):
- A. The main idea is clear.
- B. Most supporting information relates to the main idea; most relates to antecedent and subsequent supporting information.
- C. Some supporting information is out of order; however, this does not greatly alter content accuracy.
- D. The paragraph may not achieve a sense of closure.
- E. Most referential ties are clear throughout paragraph.

2 (minimally coherent):
- A. The main idea is unclear.
- B. Supporting information does not clearly relate to the main idea; some supporting information relates to antecedent and/or subsequent supporting information.
- C. The sequence of ideas is mostly not logical.
- D. There is little content accuracy.
- E. The paragraph has no sense of closure.
- F. Referential ties are often unclear.

1 (incoherent):
- A. The main idea is unidentifiable .
- B. Supporting information does not relate to the main idea; there is little which relates to antecedent or subsequent supporting information.
- C. The sequence of ideas is not logical.
- D. There is little or no content accuracy.
- E. The paragraph has no sense of closure.
- F. Referential ties are unclear throughout paragraph.

Appendix G. Comprehension Results

Table 1. Recall Results (F Tests)

	df	F	p<
Main Effects:			
group	2,87	10.8	0.0001
passage difficulty	1,87	4.78	0.031
text organization	2,87	7.95	0.0001
Interaction Effects:			
grp x pd	2,87	2.15	0.122
grp x to	4,87	0.86	0.494
to x pd	2,87	0.81	0.445
grp x to x pd	4,87	0.3	0.858
Group Effects:			
gg vs. gp	1,58	3.69	0.058
gg vs. pp	1,58	21.39	0.0001
gp vs. pp	1,58	7.31	0.008
Text Organization Effects:			
O vs. R	1,58	27.31	0.0001
O vs. S	1,58	27.17	0.0001
R vs. S	1,58	0.03	0.876

note: O = ordered; R = reconnected; S = scrambled

gg = good readers/good writers; gp = good readers/poor writers
pp = poor readers/poor writers

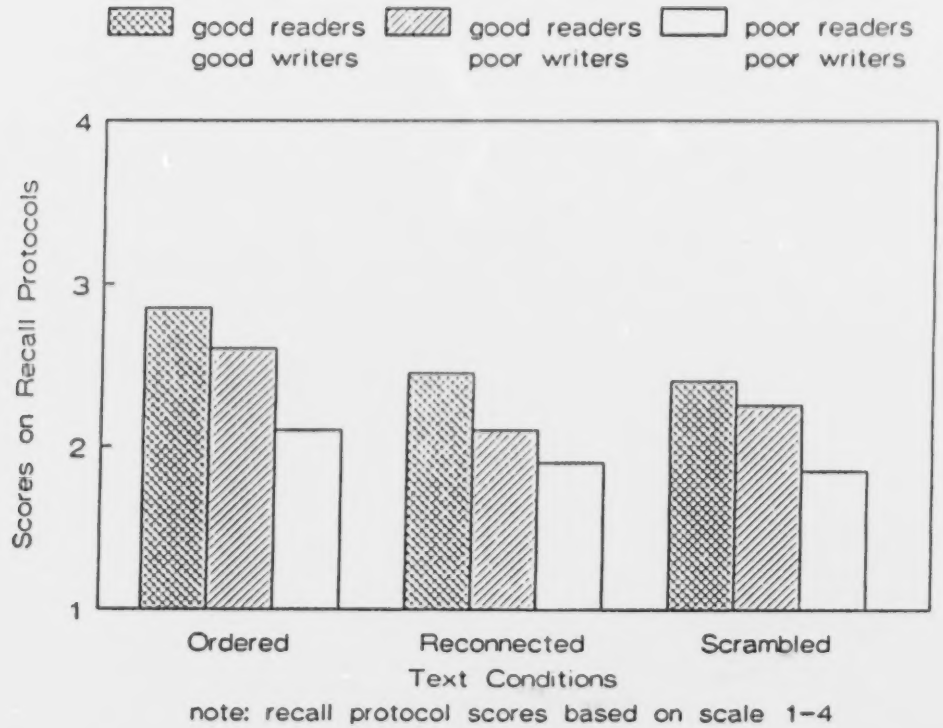
Table 2. Recall Results (Means & Standard Deviations)

Ability Groups	Text Conditon: Ordered		Reconnected		Scrambled	
6th grade paragraphs	M	SD	M	SD	M	SD
gg	2.7	0.96	2.4	0.74	2.2	0.62
gp	2.6	0.78	2.1	0.73	2.3	0.83
pp	2	0.69	1.9	0.68	1.8	0.68
9th grade paragraphs						
gg	3	0.9	2.5	0.73	2.6	0.86
gp	2.6	0.95	2.1	0.73	2.2	0.86
pp	2.2	0.93	1.9	0.62	1.9	0.7

note: mean scores based on ratings of recall protocols (scale 1-4)

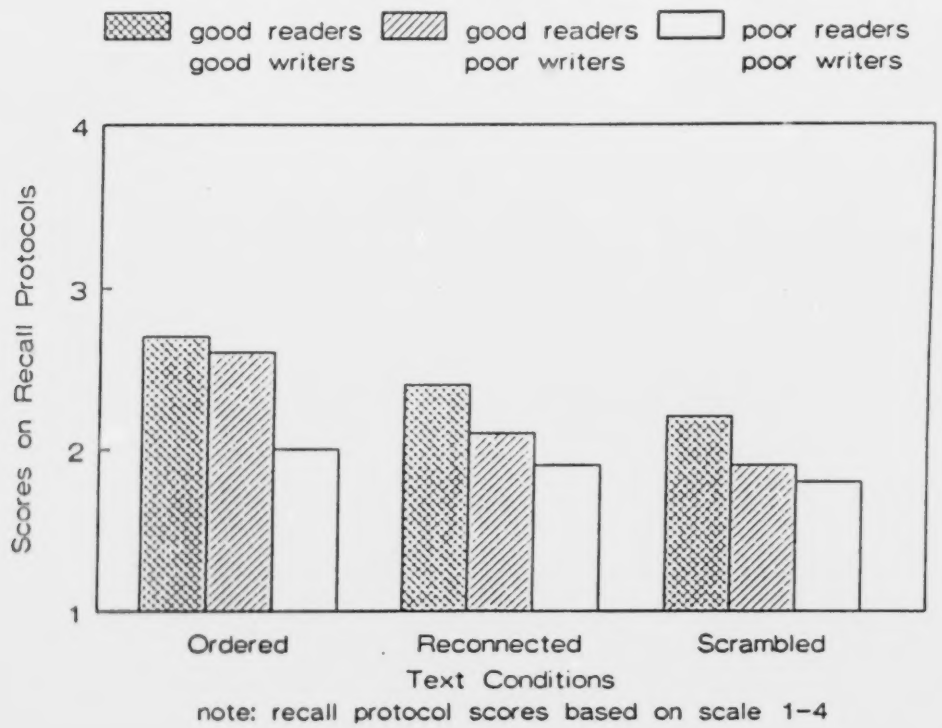
gg = good readers/good writers; gp = good readers/poor writers
pp = poor readers/poor writers

Figure 3. Differences between Ability Groups in Recall Scores in All Paragraphs in 3 Text Conditions



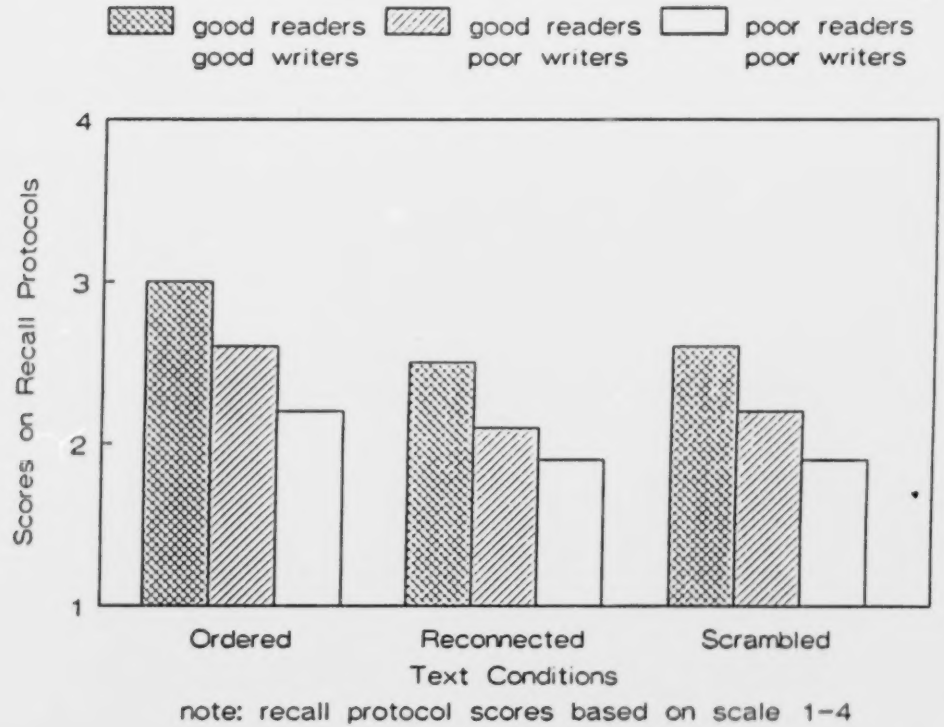
note: recall protocol scores based on scale 1-4

Figure 1. Differences between Ability Groups in Recall Scores in 6th Grade Paragraphs in 3 Text Conditions



note: recall protocol scores based on scale 1-4

Figure 2. Differences between Ability Groups in Recall Scores in 9th Grade Paragraphs in 3 Text Conditions



note: recall protocol scores based on scale 1-4

Appendix H. Rating Results

Table 1. Rating Results (F Tests)

	df	F	p<
A. Main Effects			
group	2,87	0.42	0.658
passage difficulty	1,87	2.8	0.098
text organization	2,87	51.67	0.0001
Interaction Effects:			
grp x pd	2,87	0.48	0.622
grp x to	4,87	3.73	0.005
to x pd	2,87	1.5	0.254
grp x to x pd	4,87	0.55	0.677
Text Organization Effects			
O vs. R	1,58	74.36	0.0001
O vs. S	1,58	94.71	0.0001
R vs. S	1,58	0.068	0.795
B.Text Organization Effects within Ability Groups			
Good Readers/Good Writers			
O vs. R	1,28	29.98	0.0001
O vs. S	1,28	70.23	0.0001
R vs. S	1,28	4.21	0.042
Good Readers/Poor Writers:			
O vs. R	1,28	29.02	0.0001
O vs. S	1,28	33.57	0.001
R vs. S	1,28	0.007	0.935
Poor Readers/Poor Writers:			
O vs. R	1,28	16.59	0.0001
O vs. S	1,28	7.19	0.009
R vs. S	1,28	2.31	0.132

note: O = ordered; R = reconnected; S = scrambled

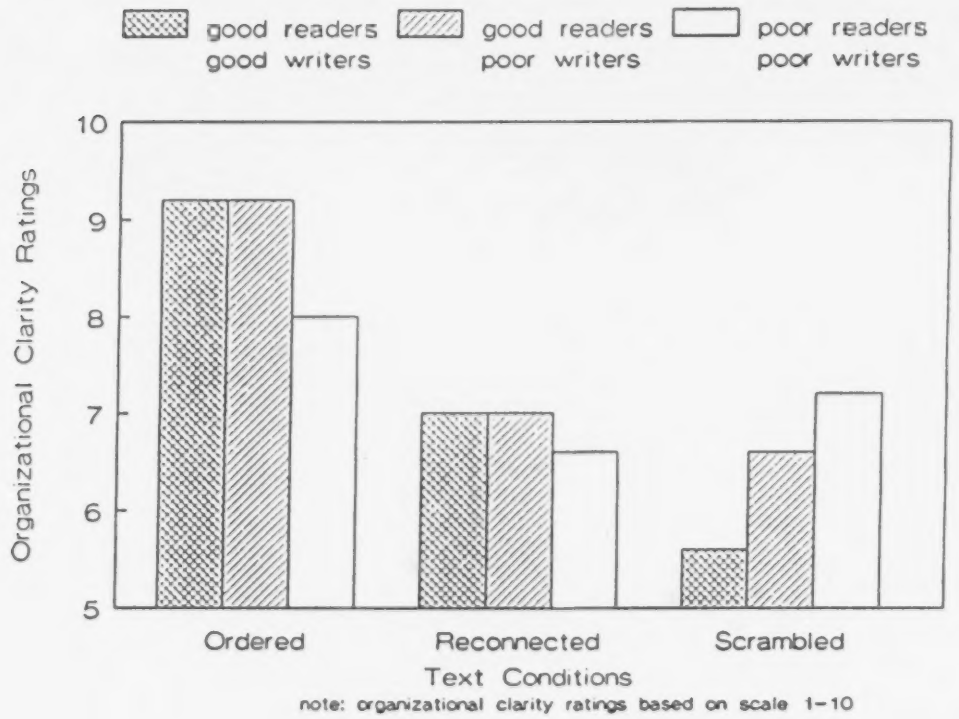
Table 2. Rating Results (Means & Standard Deviations)

Ability Groups	Text Conditon: Ordered		Reconnected		Scrambled	
	M	SD	M	SD	M	SD
6th grade paragraphs						
gg	9.2	1.16	7	2.36	5.6	2.39
gp	9.2	1.05	7	2.57	6.6	2.11
pp	8	2.19	6.6	2.4	7.2	2.5
9th grade paragraphs						
gg	8.3	1.58	6.3	2.68	6.1	2.45
gp	8.2	2.19	6.3	2.29	6.7	2.21
pp	8.1	2.32	6.4	2.86	7.1	2.64

note: mean scores based on organizational clarity ratings (scale 1-10)

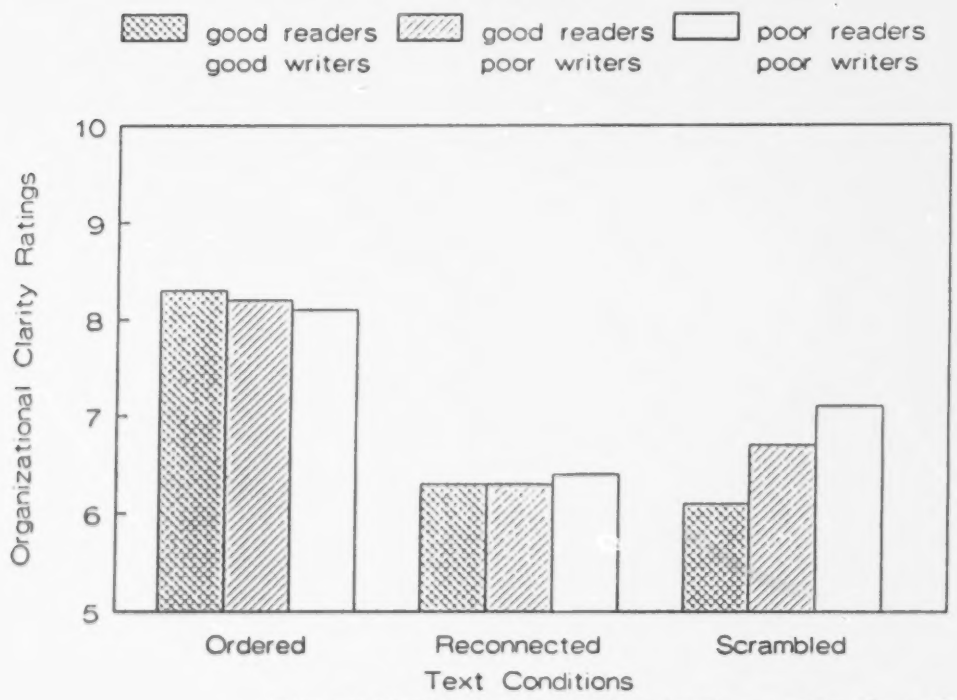
gg = good readers/good writers; gp = good readers/poor writers
pp = poor readers/poor writers

Figure 1. Differences between Ability Groups on Organizational Clarity Ratings in 6th Grade Paragraphs in 3 Text Conditions



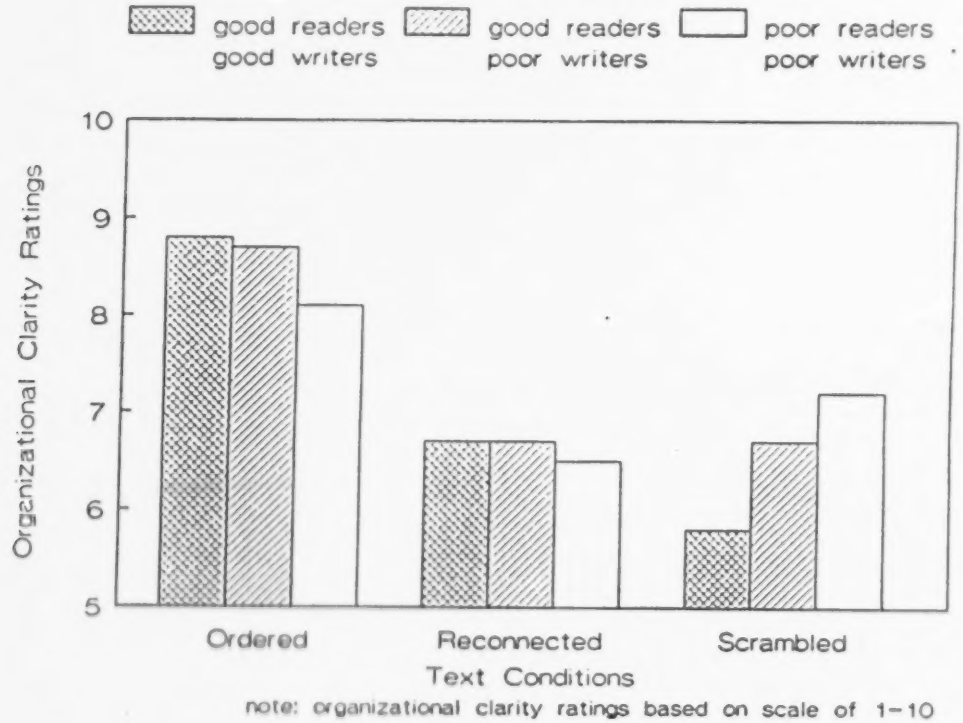
note: organizational clarity ratings based on scale 1-10

Figure 2. Differences between Ability Groups on Organizational Clarity Ratings in 9th Grade Paragraphs in 3 Text Conditions



note: organizational clarity ratings based on scale of 1-10

Figure 3. Differences between Ability Groups on Organizational Clarity Ratings in All Paragraphs in 3 Text Conditions



note: organizational clarity ratings based on scale of 1-10

Appendix I. Unscrambling Results

Table 1. Unscrambling Results (F Tests)

	df	F	p<
Main Effects:			
group	2,87	5.09	0.008
passage difficulty	1,87	15.51	0.0001
sentence length	1,87	23.93	0.0001
Interaction Effects:			
grp x pd	2,87	1.71	0.186
grp x sl	2,87	1.01	0.386
pd x sl	1,87	0.91	0.342
grp x pd x sl	2,87	1.62	0.205
Group Effects:			
gg vs gp	1,58	0.04	0.89
gg vs. pp	1,58	7.06	0.009
gp vs. pp	1,58	8.18	0.005

note: gg = good readers/good writers; gp = good readers/poor writers
pp = poor readers/poor writers

Table 2. Unscrambling Results (Means & Standard Deviations)

Ability Groups	6 sentence paragraphs		7 sentence paragraphs		combined means
6th grade paragraphs	M	SD	M	SD	
gg	3.2	0.7	2.3	1.1	2.8
gp	2.8	1	2.6	1.1	2.7
pp	2.4	1	1.9	0.8	2.1
combined mean (6th grade):					2.5
9th grade paragraphs					
gg	2.4	1.1	2.1	0.9	2.3
gp	2.5	1.1	2.2	0.9	2.4
pp	2.3	1.1	1.7	0.9	2
combined mean (9th grade):					2.2

Table 3. Means for Individual Paragraphs in Unscrambling Task

Ratings of Paragraphs x Ability Groups

	Ability Groups		
	GR/GW	GR/PW	PR/PW
Passage Difficulty			
6th Grade			
Water Cycle:	3.4	3.1	2.4
Sediment:	3.2	3.0	2.5
Sahara Desert:	2.9	3.0	2.4
Earthworms:	2.1	2.6	1.9
Acid Rain:	3.2	3.6	2.3
Glaciers:	1.6	1.8	1.4
9th Grade			
Monsoons:	2.2	2.5	1.9
Ag Depression:	1.8	1.6	1.7
Jellyfish:	3.2	3.3	3.3
Algae:	2.3	2.2	1.4
Indians:	1.8	2.1	1.7
Caribbean:	2.5	2.3	1.7

Paragraph Means across Groups

# of Sentences			
6 Sentences		7 Sentences	
Water Cycle:	2.9	Acid Rain:	3.0
Sediment:	2.9	Glaciers:	1.6
Sahara Desert:	2.7	Earthworms:	2.2
Monsoons:	2.2	Indians:	1.9
Ag Depression:	1.7	Algae:	2.0
Jellyfish:	3.3	Caribbean:	2.2

note: unscramblings rated on 1 (least coherent) - 4 (highly coherent) scale

Appendix J: Strategy Interview Results

Table 1: Strategies for Recalling Paragraphs

key words			topic-related			just remembered		
32 (33%)			16 (18%)			13 (14%)		
g/g	g/p	p/p	g/g	g/p	p/p	g/g	g/p	p/p
13	11	8	4	4	8	6	2	5
(43%)	(38%)	(27%)	(13%)	(14%)	(27%)	(20%)	(8%)	(18%)

Table 2: Recall Strategy for Scrambled Paragraphs

changed order			found main idea			remembered as is			wasn't unclear		
19 (21%)			6 (7%)			14 (16%)			4 (4%)		
g/g	g/p	p/p	g/g	g/p	p/p	g/g	g/p	p/p	g/g	g/p	p/p
7	6	6	2	2	2	7	2	5	0	1	3
23%	21%	20%	7%	7%	7%	23%	7%	18%	-	3%	10%

note: g/g = good readers/good writers; g/p = good readers/poor writers; p/p = poor readers/poor writers

Percentage totals may not equal 100% both because some students used multiple strategies and because strategy usage was only counted if both raters agreed on the strategy.

Table 3: Strategies for Rating Paragraphs

out of order (topic or sentences)			topic unclear			made sense/didn't make sense		
43 (48%)			12 (13%)			26 (29%)		
g/g	g/p	p/p	g/g	g/p	p/p	g/g	g/p	p/p
17	14	12	5	5	2	6	7	13
(57%)	(47%)	(40%)	(17%)	(17%)	(7%)	(20%)	(24%)	(43%)

Table 4: Strategies for Unscrambling Paragraphs

put topic sentence first			put in temporal or logical order			overly general response		
31 (35%)			29 (33%)			21 (24%)		
g/g	g/p	p/p	g/g	g/p	p/p	g/g	g/p	p/p
13	14	11	10	13	6	2	7	13
(45%)	(48%)	(37%)	(33%)	(45%)	(20%)	(20%)	(24%)	(43%)

note: g/g = good readers/good writers; g/p = good readers/poor writers; p/p = poor readers/poor writers

Percentage totals may not equal 100% both because some students used multiple strategies and because strategy usage was only counted if both raters agreed on the strategy.

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